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APTI (Air Pollution Training Institute) Course 444. Air Pollution Field Enforcement Instructor's Guide

(U.S.) Environmental Protection Agency
Research Triangle Park, NC

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Air Pollution Training Institute
MD 20
Environmental Research Center
Research Triangle Park NC 27711

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Air

EPA

APTI Course 444 Air Pollution Field Enforcement

Instructor's Guide

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EPA Project Officer for this manual is J. O. Dealy, EPA-ERC, MD-17, RTP, NC 27711.

16. ABSTRACT

The Instructor's Guide for the Air Pollution Training Institute Course 444 "Air Pollution Field Enforcement" contains complete information for conducting a 3½ day training course. The Guide contains course objectives, course agenda, information about past students, examinations and answer keys and 19 lesson plans with keys to visual aids. The training course is designed for field inspectors responsible for enforcement of air pollution regulations. It covers identification of air pollution violations; gathering evidence for violation abatement; conduct as a witness; handling public complaints about air pollution; compliance testing; and other related subjects.

The Instructor's Guide is used in conjunction with a Student Manual (EPA 450/2-80-075) and a Student Workbook (EPA 450/2-80-076).

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March 1980

Air

APTI
Course 444
Air Pollution Field Enforcement

Instructor's Guide

Prepared By:

C. W. Gruber, PE
Cincinnati, Ohio 45213

With Legal Units By:

P. M. Giblin
Attorney at Law
Austin, Texas 78701

Under Contract No.
68-02-3014
EPA Project Officer
James O. Dealy

United States Environmental Protection Agency
Office of Air, Noise, and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, NC 27711

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Notice

This is not an official policy and standards document. The opinions, findings, and conclusions are those of the authors and not necessarily those of the Environmental Protection Agency. Every attempt has been made to represent the present state of the art as well as subject areas still under evaluation. Any mention of products or organizations does not constitute endorsement by the United States Environmental Protection Agency.

Availability of Copies of This Document

This document is issued by the Manpower and Technical Information Branch, Control Programs Development Division, Office of Air Quality Planning and Standards, USEPA. It was developed for use in training courses presented by the EPA Air Pollution Training Institute and others receiving contractual or grant support from the Institute. Other organizations are welcome to use the document for training purposes.

Schools or governmental air pollution control agencies establishing training programs may receive single copies of this document, free of charge, from the Air Pollution Training Institute, USEPA, MD-20, Research Triangle Park, NC 27711. Others may obtain copies, for a fee, from the National Technical Information Service, 5825 Port Royal Road, Springfield, VA 22161.

AIR POLLUTION TRAINING INSTITUTE
MANPOWER AND TECHNICAL INFORMATION BRANCH
CONTROL PROGRAMS DEVELOPMENT DIVISION
OFFICE OF AIR QUALITY PLANNING AND STANDARDS

The Air Pollution Training Institute (1) conducts training for personnel working on the development and improvement of state, and local governmental, and EPA air pollution control programs, as well as for personnel in industry and academic institutions; (2) provides consultation and other training assistance to governmental agencies, educational institutions, industrial organizations, and others engaged in air pollution training activities; and (3) promotes the development and improvement of air pollution training programs in educational institutions and state, regional, and local governmental air pollution control agencies. Much of the program is now conducted by an on-site contractor, Northrop Services, Inc.

One of the principal mechanisms utilized to meet the Institute's goals is the intensive short term technical training course. A full-time professional staff is responsible for the design, development, and presentation of these courses. In addition the services of scientists, engineers, and specialists from other EPA programs governmental agencies, industries, and universities are used to augment and reinforce the Institute staff in the development and presentation of technical material.

Individual course objectives and desired learning outcomes are delineated to meet specific program needs through training. Subject matter areas covered include air pollution source studies, atmospheric dispersion, and air quality management. These courses are presented in the Institute's resident classrooms and laboratories and at various field locations.

R. Alan Schueler

R. Alan Schueler
Program Manager
Northrop Services, Inc.

James A. Jahnke

James A. Jahnke
Technical Director
Northrop Services, Inc.

Jean J. Schueneman

Jean J. Schueneman
Chief, Manpower & Technical
Information Branch

FOREWORD

The Air Pollution Field Enforcement Course, No. 444, has been in the curriculum of the Air Pollution Training Institute since its beginning in the late nineteen sixties. It has been given more than fifty times with the agenda being altered to meet the changing needs of enforcement created by frequent enactment of new air pollution legislation at the federal, state, and local government levels.

In 1977, the United States Environmental Protection Agency commissioned Charles W. Gruber, P.E., Cincinnati, Ohio and Michael V. McIntire, J. D., Santa Monica, California to survey ten diverse control agencies to determine the continuing need for training in field enforcement. The survey concluded:

> "The need is for a primary course for inexperienced personnel, as well as a 'back to basics' refresher course for experienced field enforcement officers."

In mid 1978, the Air Pollution Training Institute commissioned Charles Gruber to carry out the survey recommendations by re-writing Course 444 objectives and subject materials. Pamela M. Giblin, Attorney, Austin, Texas, was selected to contribute the legal aspects.

Both authors drew upon their personal experiences of many years of involvement in air pollution control administration and enforcement. For more than eight years, both lectured in previous presentations of Course 444.

The revised objectives and agenda, approved by the Air Pollution Training Institute at the beginning of the work, have been constructed to teach the broad principles which guide the Field Enforcement Officer in the conduct of his duties.

The Course covers three and one-half days, divided into:

First Day - The Field Enforcement Officer, His Job, How He Prepares Himself, and How He Does It.
Second Day - The Legal Aspects of Enforcement.
Third Day - The Technical Aspects and Workshops.
Fourth Day - Continuation of Third Day subjects and summation.

Three separate books comprise the course resource material:

1. The Student Manual, written especially to parallel the course sequence.
2. The Student Workbook containing the exercises.
3. The **Instructor's Manual for the course facility.**

The work was performed under the United States Environmental Protection Agency, Contract No. 68-02-3014.

February 6, 1979

Acknowledgements

A number of people contributed to this undertaking. My wife, Jean, whose background in teaching enabled her to make many constructive suggestions which improved the educational quality of the course materials. James O. Dealy, Project Officer, was constantly providing related technical materials and promptly responded to questions. Jean J. Schueneman, Chief of the Manpower and Technical Information Branch, EPA, was most helpful by his careful review of the course, and Kirk Foster, Engineer, Division of Stationary Enforcement, EPA, contributed suggestions related to federal enforcement. James Hambright, Director, Bureau of Air Quality and Noise Control, Commonwealth of Pennsylvania, originally wrote the complaint handling case study. The Instructional Development Staff of Northrop Services, Inc., the Air Pollution Training Institute Contractor for EPA, produced the art work and the slides which add substantially to the teaching efficiency of the course materials. Eleanor Chappell skillfully transcribed the manuscript to the finished product.

Charles W. Gruber, PE
Emeritus Associate Professor
Environmental Engineering
University of Cincinnati

February 6, 1979

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CATALOGUE DESCRIPTION

444
AIR POLLUTION FIELD ENFORCEMENT
3½ Day Lecture Course

PREREQUISITE:	None
COURSE DESCRIPTION:	This course is designed for the field enforcement officer responsible for enforcement of air pollution regulations who is relatively new in the field, or who wishes to have a refresher course. It provides an overview of the need for control of pollutant emissions to the atmosphere. The student is instructed in the procedures of identifying an air pollution violation, gathering evidence of the violation, and filing a citation. Classroom demonstrations illustrate proper handling of evidence for litigation and conduct of a witness in the court room. Specific training sessions are directed at recognizing control devices and inspection points to assess failure, handling odor complaints, and dealing with accident or upset air pollution episodes.
MAJOR TOPICS:	Overview of Air Quality Control The Clean Air Act and Amendments Common and Statuatory Law as Related to Air Pollution Control The Role of the Field Enforcement Officer Types of Enforcement Systems and the Enforcement Process Inspection of Air Pollution Sources Handling Public Complaints About Odors and Other Situations Hearing Boards and Courtroom Procedures, Rules for Gathering Evidence, Role of an Expert Witness Case Studies

COURSE NO. 444 GOAL OBJECTIVES

OVERALL GOAL

To maximize the effectiveness of the Field Enforcement Officer in the performance of those tasks which seek to bring sources into compliance and to so maintain them.

The overall goal is broken down into five areas of expertise:

1. Personal Development.
2. Acquisition of skills in doing day to day tasks.
3. Recognition of violations and gathering proof thereof.
4. Ability to write effective reports and orders.
5. Ability to effectively present evidence before administrative and judicial tribunals and to defend such evidence under cross-examination.

1. Personal Development. To evolve a recognition of those personal qualities which characterize an effective FEO and how these qualities are developed. Stimulate desire and enthusiasm for continuing self-training and for personal development.

2. Acquisition of Skills. Teaching the many and varied skills needed by the FEO in performing his day to day field tasks striving to bring sources into compliance and to so maintain them. The agency programs for accomplishing and maintaining compliance are:

   * The external surveillance of sources.
   * Responding to citizen complaint.
   * Conducting internal source inspections.
   * Performing field inspections for permits to construct and permits to operate as may be assigned to the FEO.
   * Reacting to emergency episodes.

3. Recognition Of Violations And Gathering Proof. From the daily field activity, certain violating situations will be observed. The ability to recognize the elements of the violation and to gather proof thereof will be taught. An understanding of the constitutional and legal (Clean Air Act and Amendments and State and Local laws and regulations) basis for action will be generated. The interaction between local, state, and federal agencies in enforcement will be discussed.

4. Writing Effective Reports and Abatement Orders. Writing of reports to serve as the official record of the action taken by the FED will be taught. The form and content of effective orders will be demonstrated.

5. Presentation of Evidence. Skill will be developed in presenting evidence in a persuasive manner through lecture, practice, and mock situations. Monitoring and enforcement of orders as an essential part of effective action will be taught.

TERMINAL OBJECTIVES

The student who successfully completes this course shall be able to:

1. Identify the fundamental relationships which structure the air pollution control programs at various levels of government in the US.
2. Demonstrate an awareness of the personal qualities needed by an FED to successfully carry out his mission.
3. Define the skills needed by the FED as he performs his day to day tasks.
4. Differentiate between good and bad job performance in field work.
5. Recognize from observation, conditions of violation as well as compliance at sources under surveillance or inspection.
6. Identify the factual information and related data necessary to prove violations.
7. Identify the principles of effective reporting for a record of the FED activity and actions.
8. State the principles of off-site surveillance.
9. Identify the various alternative measures available for bringing sources into compliance.
10. Construct evidential proof of conditions of non-compliance.
11. Identify the steps necessary to conduct on-site investigations of sources in response to observed violations, scheduled inspections, delayed compliance orders, court orders, and citizen complaints.
12. Differentiate between persuasive and ineffective testimony presented during mock direct testimony and cross-examination of witnesses.

13. Identify the Constitutional and legal basis for all actions by the FED in the process of bringing sources into compliance.

14. Identify the sequence of actions to be taken by the U.S. EPA in FCAA Section 113 enforcement actions.

15. Differentiate between role of federal, state and local control agencies in the overall enforcement program.

16. Differentiate between common law and statutory law.

17. Differentiate between administrative and litigation procedures as strategies for bringing sources into compliance.

18. Identify the major categories of control hardware from their external appearance; list the major parameters of performance; and identify a major cause of failure to perform effectively at any point in time as compared to the permit conditions.

19. Identify the principles of combustion and list the important inspection points of a coal or oil fired power plant.

The Terminal Objectives stated here will be restated in the beginning of each chapter of this Manual. They will be expanded or revised, as necessary, to fully state what you are expected to learn as you progress through the course curriculum.

Definition of "Successfully Completes the Course". You will be considered as successfully completing the course if you are present 95 percent of class time, turn in all your assignments, and receive an overall grade of no less than 70% on all tests and assignments. Active participation in class discussions and exercises may be considered where test grades are marginal.

FIELD ENFORCEMENT OFFICER

JOB DESCRIPTION

This section is included to acquaint you with the variety of tasks that may be required of the Field Enforcement Officer. Not all enforcement units are structured alike. However, the tasks included here are those generally assigned to the FEO. They are developed from the author's experience and by reference to the EPA Technical Report, "Task Analysis of State and Local Air Pollution Control Agencies and Development of Staffing Guidelines", Volume C, Field Enforcement, November, 1972.

I. General Nature of the Work.

The FEO functions in the field, having direct responsibility for securing compliance with the rules and regulations pertaining to the operation, maintenance, and inspection of air pollution source facilities. Initial construction permit and scheduled re-inspections of large technically complex source facilities as refineries, steel mills, petro chemical plants and the like, are often assigned to specialized FEO's sometimes called engineering inspectors, but responsibility for on-going operational compliance and complaint investigation nearly always is the responsibility of the general district FEO.

II. Tasks to be Performed.

A. Field Surveillance of an Assigned Area

Traditionally, the FEO has been assigned an area or "district" for the purpose of detecting: violations of the visible emission regulation, open burning restrictions, permit to construct and operate requirements; excessive damage to vegetation and large particle fallout; fugitive dust sources from construction or demolition projects; or other sensory manifestations of some condition of non-compliance with the rules and regulations. Upon detection, he conducts the necessary investigation and records the facts to prove the violation to the extent where it will allow his agency to take the required enforcement action to bring the source into compliance. Most observed violations require subsequent on-site inspection and investigation.

B. Complaint Investigation.

Complaint investigation is universally assigned to the FEO. The objective is to satisfy the complainant's request for the abatement of an alleged nuisance problem. The FEO's role is to collect enough information to determine if the complaint is valid and can be corrected through the control functions of the agency. Most valid nuisance complaint investigations require field surveillance within the area of the complaint location and often require subsequent on-site inspection and investigation.

C. On site Inspection and Investigation.

This task is defined as entering upon a source facility premises for the purpose of:

(a) inspecting for complaince with an issued document, such as a permit to construct, to operate, or to register a new or altered source;
(b) conducting a scheduled re-inspection as an annual inspection;
(c) determining compliance with a prescribed order of abatement;
(d) investigating the cause and responsibility of an observed violation and to serve the necessary notices, orders as required;
(e) completing the complaint investigation process;
(f) do such other things as are necessary to carry out the enforcement responsibility of the FEO.

Note: Often the large, highly complex technical sources, such as refineries, steel mills, petro-chemical plants, utility stations are assigned to specialty field enforcement officers, sometimes called engineering inspectors. These specially trained FEO's may be assigned either to the Enforcement or Engineering Division of the Agency.

D. Preparation of Reports and Selection of the Compliance Action.
A vital task is the documentation of the field activity of the FEO. In the case of inspections for compliance, approval or non-compliance forms are completed. For violation or complaint investigation, concise and complete reports are prepared. In many agencies (but not all agencies), upon completion of the record, the FEO takes or recommends the appropriate compliance action.

E. Serving as a witness in Court or at a Hearing.
Frequently the FEO must appear in court or before a hearing body to represent the Agency as an expert witness. They are required to make their presentation clearly and to respond calmly to cross-examination or criticism from opponents of the Agency's position.

(MODEL AGENDA)

U.S. ENVIRONMENTAL PROTECTION AGENCY
MANPOWER AND TECHNICAL INFORMATION BRANCH
AIR POLLUTION TRAINING INSTITUTE
#444 - AIR POLLUTION FIELD ENFORCEMENT
(Date) ____________________

AGENDA

COURSE LOCATION: ____________________ ____________________ ____________________

COURSE DIRECTOR ____________________

DAY & TIME	SUBJECT	SPEAKER
TUESDAY		
8:30	Registration, Welcome, Course Objectives	
9:00	Overview of Air Quality Control	
9:30	Role of the Field Enforcement Officer	
10:00	BREAK	
10:15	The Enforcement Process	
10:45	Off-Site Surveillance of Sources with Student Exercise No. 1, Section I	
11:30	LUNCH	
12:30	Off-Site Surveillance of Sources with Student Exercise No. 1, Cont'd.	
1:15	On-Site Inspection of Sources with Student Exercise No. 1, Section II	
2:45	BREAK	
3:00	Inspection of a Cement Plant Film and Workbook	
4:30	Assignment: Study for Test Read "Trial of Opacity and TSP Violation" See Student Workbook.	

ADJOURN

DAY & TIME	SUBJECT	SPEAKER
WEDNESDAY		
8:30	Written Test on first day material.	
9:00	Basic Federal Legal Provisions, Constitutional and the Clean Air Act.	____________
9:30	State and Local Laws and Administrative Procedures.	____________
10:00	BREAK	
10:15	Litigation Procedures	____________
11:00	Court Room Procedures. Film "Role of the Witness".	____________
12:00	Mock Trial of Opacity and TSP Violation. Explain and organize.	____________
12:30	LUNCH	
1:00	Mock Trial continued - Student Preparation	
2:30	Conduct Mock Trial and Discussion.	
3:00	BREAK	
3:15	Overview of the Federal EPA Enforcement Program Stressing Interaction with State and Local Enforcement Programs.	____________
4:30	Assignment: Read and do Lesson 13 in Student Workbook. Study for Test 2.	

ADJOURN

DAY & TIME	SUBJECT	SPEAKER
THURSDAY		
8:30	Legal Test	
9:00	Complaint Handling Case Study. Student discussion.	
10:15	BREAK	
10:30	Odor Detection and Evaluation	
11:30	LUNCH	
12:30	Complaint Inspection of an Asphalt Plant Film and Workbook	
2:00	Emission Control Hardware, Inspection Techniques with Case Studies	
4:30	Assignment: Study for Test 3.	
	ADJOURN.	
FRIDAY		
8:30	Inspection of Combustion Sources Film and Workbook	
10:00	BREAK	
10:15	Air Pollution Alert Procedures	
10:45	Sources of Technical Information Recommendation for Further Study at Appropriate EPA Training Courses	
11:00	Course Summation	
11:30	Final Test and Review	
12:00	Course Critique	
12:30	Course Closing	

Certificates and two and one-half (2.5) Continuing Education Units (CEU's) will be awarded to those students who attend a minimum of 95% of all scheduled class sessions and who satisfactorily pass examinations based on studies and assignments.

AGENDA

WITH REFERENCE LESSON NUMBERS AND NOTES FOR COURSE DIRECTORS AND INSTRUCTORS.

THE FED - HIS JOB - HOW HE DOES IT

DAY 1

Lesson No.	Beginning Time	Length Min.	Subject
Course Opening	8:30	30	Registration, Welcome, Course Objectives, Form Teams.
1	9:00	30	Overview of Air Quality Control
2	9:30	30	Role of the Field Enforcement Officer
	10:00	15	BREAK
3	10:15	30	The Enforcement Process
	10:45	45	Off-Site Surveillance of Sources with Student Exercise No. 1, Section I. Be sure to reach Student Exercise No. 1 before lunch. Explain exercise and make assignments. Many will eat lunch together and work during lunch hour.
	11:30	60	LUNCH
4	12:30	45	Off-Site Surveillance of Sources with Student Exercise No. 1, Cont'd.
5	1:15	90	On-Site Inspection of Sources with Student Exercise No. 1, Part II.
	2:45	15	BREAK
6	3:00	90	Inspection of a Cement Plant Film and Discussion
	4:30		Assignment: Study for Test; Rules of Test; become familiar with Student Exercise, Trial of Opacity and TSP Violations. See Student Workbook. Adjourn.

A G E N D A

LEGAL ASPECTS

DAY 2

Lesson No.	Beginning Time	Length Min.	Subject
	8:30	30	Written Test on first day material.
7	9:00	30	Basic Federal Legal Provisions, Constitutional and the Clean Air Act.
8	9:30	30	State and Local Laws and Administrative Procedures.
	10:00	15	BREAK
9	10:15	45	Litigation Procedures
10	11:00	60	Court Room Procedures. Film and Discussion. 11:00 is a key time. Film session must begin no later than 11:00 A.M. to allow time for Mock Trial Exercise.
11	12:00	150	Student Exercise. Mock Trial of Opacity and TSP Violation. Explain exercise, organize teams, make assignments.
	12:30		LUNCH (Assign 30 minute lunch hour. Suggest students eat lunch as a team and talk about case at lunch.)
	1:00		Student Exercise, continued. Student Preparation.
	2:30		Conduct Mock Trial and Discussion (Begin trial earlier if students are prepared.)
	3:00	15	BREAK
12	3:15	75	Overview of the Federal EPA Enforcement Program, Stressing Interaction with State and Local Enforcement Programs.
	4:30		Read Lesson 13 - Odor Complaint Case Study in Student Workbook. Study for Legal Test. Adjourn.

COURSE 444

AGENDA

TECHNICAL ASPECTS. WORK SHOPS.

Day 3

Lesson No.	Beginning Time	Length Min.	Subject
	8:30	30	Legal Test.
13	9:00	75	Complaint Handling, Odor Complaint Case Study. Student discussion.
	10:15	15	BREAK
14	10:30	60	Odor Detection and Evaluation.
	11:30	60	LUNCH
15	12:30	90	Complaint Inspection of an Asphalt Plant, Film and Workbook.
16	2:00	60	Emission Control Hardware, Inspection Techniques.
	3:00	15	BREAK
	3:15	75	Emission Control Hardware, Inspection Techniques, Cont'd.
	4:30		Assignments: Become familiar with Inspection of Combustion Sources, Student Manual; Study for Test No. 3. Adjourn.

COURSE 444

AGENDA

WIND-UP

Day 4

Lesson No.	Beginning Time	Length Min.	Subject
17	8:30	90	Inspection of Combustion Sources Film and Workbook.
	10:00	15	BREAK
18	10:15	30	Air Pollution Alert Procedures.
19	10:45	15	Sources of Technical Information. Recommendation for Further Study at Appropriate EPA Training Course.
	11:00	30	Course Summation.
	11:30	60	Final Test and Review. Course Critique.
	12:30		COURSE CLOSING.

STUDENT PROFILE

The Catalogue Description of the Course states that the Course is intended for those "relatively new in the field". Based on more than five years of experience giving Course 444, the student body will contain a fair number of experienced FEO's, as well as a mix of backgrounds and occupations. The following table characterizes more than 400 students who have been enrolled in recent courses.

TABLE I-1 - Demographic Characterization of Students having taken Course 444.
(Total 400 students)

Employer	
Federal EPA	14%
State Agency	48
Local Agency	35
Other	3

Educational Background	
High School	26%
Bachelor	57
Master	15
PhD	2

Occupation	
Administrator	4%
Chemist	4
Engineer	29
Phys. Scientist	2
Sanitarian	15
Technician	18
Other (Inspector)	28

Years Experience	
0 - 1 years	29%
2 - 4	39
5 - 7	22
8 -10	4
> 10	6

A Class Profile Form has been prepared for use by Course Director for current courses.

CLASS PROFILE FORM

The course director may wish, for his own information, to work up the class profile from the blue Trainee Registration Forms.

Make a photocopy for each course. The most used categories only are included.

EMPLOYER CATEGORY

U.S. EPA 01 ______________________________
State 04 ______________________________
Local 05 ______________________________
Other ______________________________

YEARS OF PROFESSIONAL AIR POLLUTION EXPERIENCE

0 - 1 __________________________
2 - 4 __________________________
5 - 7 __________________________
Other __________________________

OCCUPATIONAL CODE

Administrator 01 __________________________
Chemist 02 __________________________
Engineer 03 __________________________
Sanitarian 08 __________________________
Technician 10 __________________________
Inspector 11 __________________________
Other __________________________

EDUCATION

High School (1) _______________
Bachelor (2) _______________
Master (3) _______________
Doctor (4) _______________

PREPARATION OF CLASSROOM

Set up classroom. Preferred arrangement is a group of tables, one for each three students, upon which are placed the student name cards. Students should be mixed according to different agencies and differing years of experience. During the work sessions, inexperienced students will benefit from experienced ones and there will be maximum interchange between the groups. Provide about 10% extra seating for late registrants. Each day move students one row to the rear, bringing the last row to the front.

Also will need:

- Speaker's table with lectern.
- Projection Equipment - 2x2 slide projector, 16mm sound movie projector, overhead transparency projector and screen.
- Pointer for use by lecturer.
- Good blackboard, chalk and eraser.
- See Lesson 11 for "mock courtroom arrangement".

Distribute student manuals, course packets and other handout materials.

Check lighting, outlet plugs and needed extension cords, control of window shades, switches, etc. See that projection equipment can be operated and has spare projector bulbs. Know where to get help or spares in case of equipment failure.

Check coat storage facilities.

If a library table is to be used, set this up with reference books.

Course Director should contact local representative of APC Agency or EPA to determine if local person wishes to welcome the class and how long he will take. Do not allow more than ten minutes, as more time would play havoc with the Day I Agenda.

LESSON GOAL.

To open the course, welcome the students, give them the course objectives and the necessary information about the conduct of the course and the training accommodations. This time is to uncover any problems about the personal needs of the students while attending the course and begin development of rapport.

7:45 A.M.
Course Director comes into classroom and checks all details which were to have been done the day preceding the course opening.

Put on board:
Welcome to EPA Course 444 A. P. Field Enforcement.
Please find your assigned place.
Begin filling out Registration Card. (Blue Card)
Initial Registration List at door.

Iron out registration problems, late registrants, substitutes, no shows and seating.

8:30 A.M.
Course Director:

"Welcome to Course 444, A. P. Field Enforcement."
Introduces self: "I am ___________, the Course Director."
Writes name on board.
Instructs students to complete registration cards and mailing list requests in blue folder.
Pauses to give most of students time to complete this.
Watches for late comers during this time.

CONTENT OUTLINE (CONT'D)

Announces: Where to eat.

Restroom locations.

How to receive or make phone calls.

Arrangements for coffee during breaks.

Transportation to and from course location, if special arrangements are needed.

Any hotel problems.

Introduces local representative, if there is one.

Thanks local representative.

Adds "tie-in" remarks.

Asks for questions?

COURSE OBJECTIVES:

To offer instruction to maximize (improve) the effectiveness of the FED as he works to gain the objectives of his unit within the agency: namely, securing compliance with regulations pertaining to stationary sources.

Course is intended for those field personnel relatively new in their jobs.

However, the Clean Air Act Amendments have introduced new concepts which will be discussed.

We cannot present how you, individually, work within your agency. Procedures may vary widely, but we will present principles and practices applicable to a wide range of situations.

Course is three and one-half days.

Day 1 - The FED, his job, how he performs it.
Day 2 - Test on Day 1. Legal aspects and case study.
Day 3 - Test on Legal. Technical aspect and workshop.
Day 4 - Wind-up - final test.

You will be expected to do evening work and study.

CONTENT OUTLINE (CONT'D)

(Introduce teaching staff here, or as each lecturer starts.)

Course will close at 12:30 on fourth day - commonly Friday.
till closing.

Students successfully completing the course will earn:

A certificate of attendance.

Two and one-half Continuing Education Units.

Requirements for successfully completing course:

Attendance at 95% of classroom assembly time, turning in all assignments.
Participation in classroom discussion.
Obtain a final grade of 70%.
Tests will be objectively graded and averaged. If the numerical grade is below 70%, credit can be given for work on daily assignments and for class participation.

Throughout the course:

Questions and discussions are encouraged.

If time permits and depending on class size:

Students individually introduce themselves, or

If group is too large, introduce themselves to their partners at their own tables.

By show of hands:

How many are FED's?
How many are local and state district?
How many are state headquarters?
How many are Federal?
How many are industry?
How many are others?

Collect registration cards and mailing lists.

Go on to Lesson 1.

LESSON I

OVERVIEW OF AIR POLLUTION CONTROL

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 1

OVERVIEW OF AIR QUALITY CONTROL

COURSE: 444
LESSON TIME: 30 min.
PREPARED BY: C.W. Gruber **DATE:** 10/1/78

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. To determine how well the students understand the broad objectives and means of attainment of the air pollution control effort in the USA as described in SI Course No. 422. A model concept of ambient air quality will be presented.

LESSON OBJECTIVES. At the end of this lesson the student should be able to:

1. Recite the ultimate goal of the Air Pollution Control Agency and how progress toward the goal is measured.
2. Define ambient air quality.
3. Explain the fundamental relationships which create ambient air quality.
4. Name the criteria pollutants.
5. Differentiate between primary and secondary National Ambient Air Quality Standards and between primary and secondary pollutants.
6. Explain background pollution levels.
7. List two hazardous pollutants covered by NESHAPS.
8. Identify three meteorological parameters important in air pollution control.
9. Identify the basic concept of air quality control in the US.
10. Define atmospheric reaction products.

LESSON PLAN (CONT'D)

LESSON 1

STUDENT PREREQUISITE SKILLS.	One or more of the following: (a) Completion of SI 422, Air Pollution Control Orientation Course; (b) equivalent college training in air pollution control; or (c) job experience to provide equivalent understanding of air pollution control practice in the USA.
LEVEL OF INSTRUCTION.	This lesson probes for the general level of knowledge in the broad field of air quality control practice. It is not intended to provide new knowledge but to orient the students into a pattern of teaching which depends heavily on class discussion.
INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	High school graduation or better, but no specific technical background is required. Some on-the-job experience is helpful. More than four years of successful functioning as an FED may over qualify the student and he will become bored. If such is the case, stress the parts of the course which deal with legal aspects and the updating of present practice to include the recent amendments to the Federal Clean Air Act, and the opportunity to contribute to the instruction of the lesser experience students.
SUPPORT MATERIALS, EQUIPMENT LISTS.	35 mm Slides 35 mm Slide Projector and Screen Blackboard
SPECIAL INSTRUCTIONS.	This lesson is important in setting the tone for the course and getting the students to respond and contribute. The lesson format will "break the ice" in encouraging the students to participate. It will give the instructor a feel for the level of student knowledge of the air pollution control program in the US.

LESSON PLAN (CONT'D)

LESSON 1

The lesson will start as a verbal quiz with questions flashed on the screen from slides. The conceptual AAQ Model will be presented and then the discussion will return to the question and answer format. The instructor, in most cases the course moderator, will use a mix of volunteer and directed responders.

SELECTED REFERENCES. The course moderator and all instructors should be familiar with the content of SI 422C. All Area Training Centers will have at least one copy of SI 422C, Air Pollution Control Orientation Course, supplied by the Air Pollution Training Institute, Research Triangle Park, NC 27711. APTI, EPA, 1978 available from National Audio Visual Center, Ref. Sec/RL, GSA, Washington DC 20409.

CONTENT OUTLINE

(TIME SCHEDULE)

Course 444

Lecture Title OVERVIEW OF AIR POLLUTION CONTROL

NOTES

		Time Of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	QUESTIONS TO DISCUSSION OF MODEL	2	4
	A. MODEL	10	14
	B. QUESTIONS 8 through end	10	24
III.	AIR QUALITY CONTROL IN U.S.	2	26
IV	CONCLUDING STATEMENT AND QUESTIONS	4	30

Course: 444

Lecture Title: OVERVIEW OF AIR POLLUTION CONTROL

I. INTRODUCTION

State the lesson goal and lesson format.

Much of the material covered in this lesson is a review of SI Course 422, Air Pollution Control Orientation.

Q. How many have been through SI 422?

II. QUESTIONS AND DISCUSSIONS

1. Q. What is the ultimate objective (goal) of the Air Pollution Control Programs in the US?

Slide 1-1
Question

A. An outdoor air quality free from adverse effects on health and welfare and prevention of significant deterioration.

Q. What is health?
Q. What is welfare?

SM p. 1-2

2. Q. How is progress toward this goal determined?

Slide 1-2
Question

A. By measuring ambient air quality (AAQ).

3. Q. What is AAQ?

Slide 1-3
Question

A. A pattern of the occurrences of levels of air contaminants in the outdoor air.

Pattern implies variability.

4. Q. What determines AAQ?

No Slide
Lights on

A. AAQ results from the summation of all emissions from sources, atmospheric reaction products, background inflow, and re-intrainment of surface contaminants, all transported, diffused or accumulated, depending upon meteorological parameters.

5. A conceptual AAQ model

Put model on
blackboard

$$AAQ = \frac{E + A + B + C}{F}$$

CONTENT OUTLINE (CONT'D)

LESSON 1

Basic	Slide. No pollutants. For clarity, sources are separated from receptors.	Slide 1-4
E	is the sum of emissions from stacks and vents plus the fugitive emissions from storage piles, materials handling, construction and demolition, building openings, etc. These are the identified point and area sources of the AQCR. The units are $\frac{g}{\theta}$.	Slide 1-5
A	are the atmospheric reaction products - Units are $\frac{g}{\theta}$.	Slide 1-6
B	are the background pollutants, those which flow in. The units are $\frac{g}{\theta}$.	Slide 1-7
C	are the re-entrained surface contaminants, and natural pollutants from within the AQCR. The units are $\frac{g}{\theta}$.	Slide 1-8
F	are the meteorological influences, the dominant ones being horizontal and vertical air flow in and out of the AQCR. As F values rise, AAQ values diminish, (AAQ improves) so F is placed in the denominator of the model. The units are $\frac{m^3}{\theta}$.	Slide 1-9

Repeat the AAQ model.

$$AAQ = \frac{E + A + B + C}{F}$$

CONTENT OUTLINE (CON'D)

LESSON 1

E Primary pollutants

A Influenced by mixing layer and by solar radiation.

B Background influenced by pollution from other AQCR.

C Influenced by wetted surfaces or snow cover.

Sum up meteorological factors.

(a) wind flow

(b) Stability or turbulence

(c) Solar radiation (amount of sunshine)

(d) Other - rain, wet surfaces, snow cover

CONTENT OUTLINE (CONT'D)

LESSON 1

Now continue with question and answer format.

6. Q. How do we gauge if Ambient Air Quality is good or bad? — Slide 1-10 Question

   A. By measuring and comparing levels with National Ambient Air Quality Standards (NAAQS).

7. Q. Who established NAAQS? — Slide 1-11 Question

   A. Administrator of EPA, after criteria are published and comments are received.

   We call NAAQS "Criteria pollutants".

8. Q. Do the states use only NAAQS? — Slide 1-12 Question

   A. No. Some states have their own standards, authorized by their own state law. This is provided for in the CAA if the state standards call for a better quality than NAAQS.

9. Q. What are the criteria pollutants? (Draw out and list on board.) — Slide 1-13 Question

   A. CO; SO_2; NO_2; HC non-methane; PhO_x (O_3); Total Suspended Particulates, and Lead (P_b).

10. Q. Do we have a single set of NAAQS? — Slide 1-14 Question

    A. No - primary and secondary.

11. Q. What is difference between primary and secondary NAAQS? — Slide 1-15 Question

    A. Primary standards protect health. Secondary standards protect welfare.

CONTENT OUTLINE (CONT'D)

LESSON 1

12. Q. Must the FEO be able to justify the NAAQS values?

Slide 1-16 Question

A. No - leave this up to medical profession, but he should have basic understanding of impact.

13. Q. What are the "hazardous air pollutants" as defined by the CAA? How are they controlled? Name three.

Slide 1-17 Question

A. Hazardous pollutants are those which may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness. Controlled by enforcing NESHAPS standards.

Asbestos, beryllium and mercury.

14. Q. Are there other pollutants of concern?

Slide 1-18 Question

A. Yes. States and local air pollution control programs deal with many pollutants which are not federally regulated because they are of special concern to the area.

Example: Fluorides in Florida; odor in Bay Area, California.

Stop here on the Question and Answer format.

III. AIR QUALITY CONTROL IN THE UNITED STATES

A two level program:

SM 1-5

A - States and their political sub-divisions (call local).

B - The Federal Program

IV. CONCLUDING STATEMENT

The FEO is involved in a program which is extremely complex; politically, technically, socially and economically. The following lesson will show that the FEO plays a major role in this perplexing interrelated effort.

INSERT EMULSION SIDE DOWN

2/79 144 LESSON 1 FILE NO. 1

[illegible] UNITED STATES?

1

HOW IS PROGRESS TOWARD THIS GOAL DETERMINED?

2

WHAT IS AAQ?

3

4

5

6

7

8

9

HOW DO WE GAUGE IF AMBIENT AIR QUALITY IS GOOD OR BAD?

10

[illegible] NAAQS?

11

DO THE STATES USE ONLY NAAQS?

12

WHAT ARE THE CRITERIA POLLUTANTS?

13

DO WE HAVE A SINGLE SET OF NAAQS?

14

WHAT IS THE DIFFERENCE BETWEEN PRIMARY AND SECONDARY NAAQS?

15

MUST THE EPA BE ABLE TO JUSTIFY THE NAAQS VALUES?

16

WHAT ARE THE HAZARDOUS AIR POLLUTANTS AS DEFINED BY THE CAA? HOW ARE THEY CONTROLLED? NAME THREE.

17

ARE THERE OTHER POLLUTANTS OF CONCERN?

18

LESSON 2

ROLE OF THE FIELD ENFORCEMENT OFFICER

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 2

THE ROLE OF THE FIELD ENFORCEMENT OFFICER

COURSE: 444
LESSON TIME: 30 min.
PREPARED BY: C. W. Gruber **DATE:** 10/1/78

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. To describe the job characteristics of the FEO, his necessary personal qualities, and how he works to become outstanding in the performance of his assigned duties.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. State the role of the field enforcement officer.
2. State three job related requirements a newly hired FEO must learn.
3. State what determines the scope of the field operations program.
4. State at least five field enforcement activities.
5. Identify at least five specific characteristics of the FEO's job.
6. State at least three methods of continuing self-education by day to day working experience.
7. List at least four personal qualities or skills needed by the FEO.
8. Identify three non-verbal influences in communications.

STUDENT PREREQUISITE SKILLS Completion of SI 422, Air Pollution Control Orientation Course or equivalent job experience.

LEVEL OF INSTRUCTION. This lesson is mostly descriptive in non-technical language. It is meant to indoctrinate the non-experienced FEO with the importance of his field work. It requires logical thought processes to arrive at conclusions on the best way to get results in the field.

LESSON PLAN (CONT'D)

LESSON 2

INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	No specific technical background is required. Some on-the-job experience is helpful. More than four years of successful functioning as an FEO may "over qualify" the student, except for updating his basic knowledge of enforcement practices to the changing patterns of the Clean Air Act Amendments.
SUPPORT MATERIALS EQUIPMENT LISTS.	35 mm Slides 35 mm Projector and Screen Blackboard
SPECIFIC INSTRUCTIONS.	The key point of this lesson is that the job of the FEO is people and situation oriented. The success of each enforcement action depends heavily on how well the FEO does his job. This lesson points to Lesson 5. - On-Site Inspection. The instructor should have some agency enforcement experience or contact with an agency to fully comprehend the role of the FEO.
SELECTED REFERENCES.	The Student Manual, Chapter 2 and the instructor's experience with enforcement will provide the best background material. Chapter 2 provides selected references.

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 1

NOTES

Course: 444

TIME SCHEDULE
LESSON 2

Lecture Title: THE ROLE OF THE FIELD ENFORCEMENT OFFICER

		Time of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	ROLE OF THE FEO	2	4
III.	SCOPE OF THE FIELD OPERATIONS PROGRAM	2	6
IV.	FIELD ENFORCEMENT ACTIVITIES	2	8
V.	CHARACTERISTICS OF THE FEO JOB	5	13
VI.	PERSONAL QUALITIES AND SKILLS	10	23
VII.	ORIENTATION AND TRAINING	5	28
VIII.	SUMMARY	2	30

CONTENT OUTLINE

Course: 444 LESSON 2

Lecture Title: THE ROLE OF THE FIELD ENFORCEMENT OFFICER

Page 1 of 6

NOTES

I. INTRODUCTION. (Lesson Goal)

To describe the job characteristics of the FEO, his necessary personal qualities, and how he works to become outstanding in the performance of his assigned duties.

II. ROLE OF THE FEO.

A. Importance of the FEO to Success of Enforcement — SM p. 2-2

1. The FEO is the contact person.

- He represents the Agency in the field.
- He deals with people face to face.
- He "is" the Agency, in the eyes of the general public.

2. The "bottom line" of the enforcement action.

Ultimate success or failure depends heavily upon how well the FEO does his job.

III. SCOPE OF THE FIELD OPERATIONS PROGRAM. — SM p. 2-2

A. Major External Determinants

1. The number and types of stationary sources that require inspection.

2. The status of compliance with the regulations, compliance plans, consent orders, agreements, etc.

B. Major Internal Determinants

1. The complexity of rules and regulations to be enforced.
2. Source registration support required.
3. Permit and Certification systems support required.
4. Frequency of required periodic reinspections.
5. Administrative and enforcement policies of the Agency.

CONTENT OUTLINE (CONT'D)

LESSON 2

IV. FIELD ENFORCEMENT ACTIVITIES.

SM p. 2-3 (board)

- * Field surveillance and complaint investigation.
- * Source facility inspection.
- * Report writing, composing orders, recommend or serve notices of violation.
- * Assist in developing a formal compliance plan.
- * Serve as witness before a hearing board or court.
- * Assist in stack tests or collecting samples.
- * Carry out special field duties during air pollution alerts and emergencies.

V. CHARACTERISTICS OF THE FED JOB

A. General

1. The FED's job is both people and situation oriented.

B. Specific

The FED is:

Q. What is FED responsibility for solving problems?

Discuss

1. Constantly meeting and dealing with people face to face, frequently in an adversary situation.
2. Obtaining information.
3. Conducting investigations, seeking provable, factual evidence.
4. Answering questions, solving problems.
5. Forming judgments.
6. Taking enforcement actions.
    - * Serving notices of violation, or
    - * Making recommendations for enforcement actions.
7. Preparing and preserving the record in written reports.
8. Giving persuasive testimony.

An unusual person is required to handle such a variety of duties with skill and diplomacy to attain the desired results. (Compliance within shortest time and minimal legal litigation.)

CONTENT OUTLINE (CONT'D)

LESSON 2

VI. PERSONAL QUALITIES AND SKILLS

SM p. 2-3

A. Mature Personality

1. He is capable of dealing with the public in an efficient, businesslike manner, often under strained conditions. He is courteous but firm.

2. He listens to caustic comment and criticism without "blowing his cool".

B. Ability to Communicate

1. Verbal

* To the FEO, words are the "tools of his trade".

* Communicating is more than a matter of people talking to each other. Be sure the other party understands the full meaning and import of what you say and what you want him to do (if anything).

* Effective communications may well be the lubricant that can prevent needless friction between violator and enforcer.

* Avoid ordering or commanding. "Do this because I say so."

2. Non-verbal communications

* How the FEO acts, dresses, the level of his calmness and self-assurance.

* Don't make it tough for yourself by going to an interview with a "chip on your shoulder" and showing it.

CONTENT OUTLINE (CONT'D)

LESSON 2

C. Dress and appearance

- General appearance must be neat and well groomed.
- One call may be into the president's office. The next may be into a dirty, stinking plant.
- Heat and cold to contend with.
- Do not overdress.
- Have your own protective clothing available.

Your own hard hat,
Protective eye glasses,
Lightweight overshoes,
Shop coat, or clean oversized coveralls to fit over your outer clothing.

Note: City of Philadelphia states:

Reference (2)

"Proper attire is required at all times on the job. A tie is necessary always and a suit coat or sports jacket must be worn. If the weather is uncomfortably hot, the coat may be removed, but it should be available, i.e., in the car so that it can be worn if the situation should require it. Exceptions to clothing requirements are made for inspectors on night shifts or special (dirty) details."

D. Investigative Skill

1. Ability to gather facts and organize them in a concise manner requires the FED to

Be observant.

Be Resourceful.

Sift meaningful from diversionary or unimportant.

Seek facts without vehemence.

Develop skill in drawing out information (which may be used against his adversary's best interest).

CONTENT OUTLINE (CONT'D)

LESSON 2

E. Ability to Learn

1. Technical aspects of the field of air quality management and source control technology.

   Use each inspection as another learning process. The doctors and lawyers practice--so should the FED.

2. Develop a potential for legal enforcement.

   Relate regulations, by number, to corresponding situations encountered in the field.

F. Function as a Member of a Team

Notwithstanding the central role of the FED in an enforcement action, especially in the larger and more complicated litigations, the FED must fully develop rapport with the engineering and technical groups, how his role supports them and vice versa.

VII. ORIENTATION AND TRAINING

SM p. 2-5

How does FED attain proficiency?

A. Orientation

1. Must learn air pollution law and rules and regulations language and section numbers of those he enforces.

   Read them and understand them.

2. Learn administrative procedures.

CONTENT OUTLINE (CONT'D)

LESSON 2

B. Technical Training

1. Basic knowledge of combustion processes and equipment operation.
2. Be able to identify equipment and processes and the parameters which relate to emission potential.
3. Must develop a storehouse of operating characteristics of the processes that abate air pollution emissions.
4. Study and use reference texts, materials, publications. Assemble your own reference library.

C. Attain Expert Status

Must attain expert status in opacity reading by smoke schools and practice.

D. Continuing Education

* Available EPA self instructional courses.
* Specialized EPA training courses.
* Appropriate technical meetings.
* Specialized college courses.
* Seminars and conferences sponsored by the agency for exchange of information.
* Selected reading of professional journals and informational materials.

VIII. SUMMARY.

SM p. 2-6

* The FEO's job is both people and situation oriented.
* Effective communications are a "must".
* In the eyes of the general public, "he is the agency".

LESSON 3

THE ENFORCEMENT PROCESS

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 3

THE ENFORCEMENT PROCESS

COURSE: 444
LESSON TIME: 30 min.
PREPARED BY: C. W. Gruber DATE: 10/1/78

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL.

To present an overview of the enforcement process by which sources are brought into compliance and so maintained. Emphasis will be on the functioning of the FEO within the process.

LESSON OBJECTIVES.

At the end of this lesson, the student should be able to:

1. State the mission of the enforcement operation of an agency.
2. Identify three major enforcement systems.
3. State at least six ways how construction permits aid enforcement.
4. Identify the Federal jurisdiction for new construction permit review.
5. State the purpose of a "Policy of Enforcement".
6. State the three degrees of compliance.
7. State at least eight of the milestones included in a Compliance Plan Schedule.

STUDENT PREREQUISITE SKILLS.

Completion of SI 422, Air Pollution Control Orientation Course; equivalent college training in air pollution control; or job experience to provide equivalent understanding of air pollution control practice in the USA.

LESSON PLAN (CONT'D)

LESSON 3

LEVEL OF INSTRUCTION.	This lesson is descriptive in non-technical terms. It is intended to introduce the various processes available for enforcement of the rules and regulations. In depth treatment of each enforcement method will be given in other lessons.
INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	No specific technical background is required. Some on-the-job experience is helpful. More than four years of successful functioning as an FEO may over-qualify the student and he will become bored. If such is the case, stress the parts of the course which deal with legal aspects and the updating of present practice to include the August, 1977 amendments to the Clean Air Act, and the opportunity to contribute to the instruction of the lesser experience students.
SUPPORT MATERIALS EQUIPMENT LISTS.	35 mm Slides 35 mm Slide Project and Screen Blackboard
SPECIAL INSTRUCTIONS.	A most important point in this lecture is that in every observable or provable violation, alternative action routes to secure compliance are available. Therefore, a decision is necessary to select the appropriate route. Where an agency has more than one FEO, a rather clear enforcement policy must be set down by the Enforcement Chief so that a near uniform response to violation among the several FEOs will be achieved, in contrast to "tough and lenient" FEOs operating within the same agency. No attempt is to be made to say which enforcement policy is preferred, as the choice truly rests with each agency.
SELECTED REFERENCES.	Student Manual Chapter 3.

CONTENT OUTLINE

Course: 444
Lecture Title: TIME SCHEDULE
LESSON 3
THE ENFORCEMENT PROCESS,
AN OVERVIEW

Page 1 of 1

NOTES

		Time of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	MISSION OF ENFORCEMENT OPERATIONS	1	3
III.	ENFORCEMENT SYSTEMS	2	5
IV.	PERMITS, CONSTRUCTION AND INITIAL OPERATION	3	8
V.	CYCLIC OPERATING PERMITS	3	11
VI.	COMPLIANCE PLAN INSPECTION	3	14
VII.	SURVEILLANCE AND COMPLAINT	2	16
VIII.	DEGREES OF COMPLIANCE	2	18
IX.	ENFORCEMENT ACTIONS	2	20
X.	ENFORCEMENT POLICY	5	25
XI.	SUMMARY	5	30

CONTENT OUTLINE

Course: 444
Lecture Title: LESSON 3
THE ENFORCEMENT PROCESS

Page 1 of 9

NOTES

I. INTRODUCTION

SM p. 3-2

A. Lesson Goal

Enforcement actions vary widely among agencies. Policies selecting the enforcement strategy are as individualistic as the agencies themselves. This lesson presents the many and varied enforcement mechanisms. It is hoped this lesson will widen the FEO perspective of enforcement even though he is not free to choose, on his own beliefs, from the mechanisms available. He is, or should be, directed by the regulations and agency policy in such matters.

Q. - Do you agree?

II. MISSION OF THE ENFORCEMENT OPERATIONS

To carry out those field operational tasks designed to bring all sources into compliance with the regulations at the earliest possible time and to so maintain them.

III. ENFORCEMENT SYSTEMS

SM p. 3-2

Control strategies are woven into four enforcement systems for implementation. The FEO carries out the field operations of one or all four enforcement systems:

- Permits to construct and initially operate
  Also Registration for sources with lesser emission potential.
- Cyclic permits to operate.
  (Scheduled periodic inspections)
- Compliance plan enforcement.
- Surveillance and complaint response.

IV. PERMITS TO CONSTRUCT AND INITIALLY OPERATE

SM p. 3-2

A. Jurisdiction

Permit systems are administered by Local, State and the Federal EPA for review.

CONTENT OUTLINE (CONT'D)

LESSON 3

1. Local and State Permit Regulations

   Usually all sources which have significant emission potential are included.

2. Federal Preconstruction Requirement is generally a reviewing process.

   PSD

   FCAA §165 (a) p82
   §169 (1) p88

   a. In attainment areas for PSD, any source having a potential emission greater than 250 TPY or 100 TPY for 28 specific sources and (now for particulates & SO_2 only)
   b. In non-attainment areas, any source which has a greater potential than 100 TPY.

B. Registration

For sources not requiring federal permit, some agencies use "registration" instead of "permits". Some, as in Ohio, use state permits for all but minor sources, less than 25 T/year potential with "registration for said minor sources.

Registration processing is similar to permit processing except pre-construction review and approval is not required, but it may occur in an advisory context.

C. The Permit and Registration Systems aids enforcement by:

1. Providing for engineering review prior to construction. Changes can be made with less cost than after construction. (Not applicable to Registration.)

2. If the new source does not comply in all respect, construction is prevented before it starts.

3. Permit document can be required to highlight parameters which are important to proper functioning of control equipment.

4. Insuring that required emission monitors will be installed.

5. The permit document can be required to include an operations and maintenance program.

CONTENT OUTLINE (CONT'D)

LESSON 3

6. If inspection or tests show non-compliance, operation permits are denied and source cannot legally operate until it is in compliance.

7. Giving notice of change--adding new sources.

8. Keeps the emission inventory up to date.

9. Where FEO does field inspection, it is a good continuing training program; allows him to see good equipment as it is being constructed.

V. CYCLIC OPERATING PERMITS

SM p. 3-5

A. Purpose

To require a periodic re-evaluation of sources by scheduling on-site reinspection, or other review process, to determine compliance status with regulations and/or conditions of the initial permit for the purpose of granting or denying a permit to operate.

B. Aids Enforcement by:

1. Subjecting source to periodic review.

2. Where non-compliance is in evidence, denial of operating permit adds "clout" to the overall enforcement program by making operation of the source per se a violation.

3. Provides a periodic updating of the original permit documents such as: ownership change, process change, materials change, etc., which would require a new construction permit.

CONTENT OUTLINE (CONT'D)

LESSON 3

4. Providing for a systematic check of all emissions by
   - (a) Reviewing recorded emission data.
   - (b) Observing emission indicating devices.
   - (c) Checking for compliance with instrument calibration procedures.
5. Updating the emission inventory.
6. Educating plant personnel on importance of and requirements for air pollution control through contact with FEO.

VI. COMPLIANCE PLAN INSPECTION

SM p. 3-5

A. Purpose

To inspect for progress the specific "milestones of a Compliance Plan, Administrative Order or Court Order".

B. Compliance Plan Schedule

Every enforcement order should have a time table for attaining compliance and a specified penalty for failure to meet the scheduled milestone.

A compliance plan for the construction or reconstruction of a major control facility would include the following milestones, or some other appropriate items:

1. Engineering study, pilot studies and source testing to generate process and emission data, and cost estimates.
2. Approval of funds by management (Board of Directors). Most Important Step.
3. Completion of final design, take bids and select best proposal.
4. Secure approval of APC Agency. Secure construction permit.
5. Place order for equipment.
6. Delivery of equipment.

CONTENT OUTLINE (CONT'D)

LESSON 3

7. Installation and "shakedown" runs.

8. Source test for compliance.

9. Secure operating permit.

10. Turn over to operating department.

(It now becomes the object of reinspection for operating permit renewal and surveillance.)

The City of Philadelphia, Enforcement Procedures Appendix 10 contains an example of a form for an Emission Abatement Action, Compliance Schedule Summary. See Figure 3.9.

Example on Page 3-9 SM

C. Aids Enforcement by:

1. Time slippage can be spotted and action taken to increase the tempo of the compliance program.

2. Save valuable time in generating legal complusion if there is no action or gross deviation from time schedule.

3. Penalties for non-compliance are visible to the owner.

VII. SURVEILLANCE AND COMPLAINT

SM p. 3-6

A. Surveillance

1. Watching over an assigned district to spot observable violations, generally from outside of the source boundary.

2. Might include surprise (unscheduled) visits to marginal sources for in-plant check of specified processes, and around-the-clock observation in special cases.

B. Citizen Complaint

Response to citizen complaint is a significant part of the FED's job. A complaint can involve a specific violation, such as visible emission or it can and often does relate to nuisance.

Complaint management will be covered in Lesson 14.

APPENDIX 10
AIR MANAGEMENT SERVICES
EMISSION ABATEMENT
COMPLIANCE SCHEDULE SUMMARY

Firm Name and Address:

Process, Operation or Activity related to compliance schedule:

Name, Title and Address of Company official authorizing Compliance schedule:

Name, Title and Address of Person completing summary:

Date of preparation of Summary:

A. Type of Abatement Activity to be Undertaken. (Check one or more categories below, as appropriate. Use separate summary form for each process, operation or activity to be covered by a compliance schedule).

- ☐ Process/equipment change or modification
- ☐ Maintenance or operational change
- ☐ New control equipment installation
- ☐ Additional control equipment installation
- ☐ Modification to existing control equipment or appurtenances
- ☐ Installation of instrumentation or automatic controls
- ☐ Cessation of process, operation or activity
- ☐ Other

B. Description of Abatement Activity(ies). (Give general description of abatement activities as indicated in "A" above).

C. Compliance Schedule Profile. (Indicate projected completion date adjacent to activities below which pertain to the compliance schedule to be undertaken).

1. Engineering studies to be completed by:
2. Pilot Studies or tests to be completed by:
3. Appropriations requested by:
4. Appropriations approved by:
5. Permit application to be submitted by:
6. Purchase order to be issued by:
7. Control equipment to be delivered by:
8. Auxiliary equipment, instrumentation or controls to be delivered by:
9. Control equipment installation completed by:
10. Process/equipment change or modification completed by:
11. Maintenance or operational changes to be instituted by:
12. Control equipment modification completed by:
13. Start-up or operation to commence by:
14. Cessation of process or operation by:

D. Effect of Contingencies on Completion of Compliance Schedule (Indicate any known or contemplated contingencies which could effect the time schedules as listed in "C" above).

Signature & title of authorizing company official:

CONTENT OUTLINE (CONT'D)

LESSON 3

VIII. DEGREES OF COMPLIANCE

SM p. 3-8

All sources are not always and positively in or out of compliance now and forevermore. There are three degrees of compliance

A. Continuing Compliance

The source is equipped and will operate continuously, with great assurance, that it will be within the regulations. Continuing compliance implies confidence the source will operate day or night, day after day, with little risk of violation. Requires minimal surveillance - a good source.

Good Plant

B. Functional Compliance

A marginal source in compliance at time of observation or inspection, but little assurance of long term compliance.

Marginal

C. Non-Compliance

Violation conditions, supported by valid evidence justifying enforcement action.

Needs Work

IX. ENFORCEMENT ACTIONS

SM p. 3-8

A. Enforcement Actions Available

Each agency develops its own enforcement procedures and policies.

1. Two extremes
    - a. A program based entirely on voluntary compliance by source owners under specific order from the control agency.
    - b. "File legal action first and talk later."
2. Most agencies operate somewhere in between, gearing the enforcement action to fit:
    - a. The circumstances of the violation.
    - b. The agency resources, and
    - c. The specifics of the statutes.
    - d. The availability and effectiveness of legal assistance, including the judicial processes in the area.

CONTENT OUTLINE (CONT'D)

LESSON 3

X. ENFORCEMENT POLICY

SM p. 3-9

A. What is it?

An established policy of the agency which directs the FEO in how he reacts to a violation.

B. Purpose

To have all FEOs of a jurisdiction acting uniformly in like situations.

C. How is it communicated?

1. Written directives.
2. Word of mouth from supervisors.
3. Meetings of FEOs with supervisors.
4. Word of mouth from other FEOs.
5. By distribution of case summaries which show proper selection of mode of attack.

D. Discussion

Query - How many have an established policy?
- How do you know how to react?
- How are policies communicated?
- Etc.

CONTENT OUTLINE (CONT'D)

LESSON 3

XI. SUMMARY

SM p. 3-9

A. All enforcement actions have a common objective to:

Secure a condition of continuing compliance of sources.

B. For emphasis close with:

From the very first contact, each contact, each record, each notice, should be part of a carefully designed case record which will assure successful prosecution of a case in a court of law even though the policy of the agency is co-option. When this is done, voluntary compliance works best and if it fails, judicial decisions in the courts will be favorable.

LESSON 4

OFF-SITE SURVEILLANCE
OPACITY, DOCUMENTATION

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 4

OFF-SITE SURVEILLANCE,
OPACITY, DOCUMENTATION

STUDENT EXERCISE NO. 1, SECTION I

COURSE: 444

LESSON TIME: 90 min.*

PREPARED BY: C.W. Gruber **DATE:** 10/1/78

*Lecture - 30 min.
Student Exercise No. 1, Sec. I-60 min.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. The purpose of this lesson is to bring into focus that element of the enforcement program which seeks out violating conditions by surveillance of a district, surveillance prior to making an on-site inspection, or surveillance of a limited area by simplified instruments or effects indicators. The elements needed to establish a violation and how they apply to opacity surveillance are included.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. State at least five different violating conditions sought out during surveillance.
2. Explain three different ways surveillance is exercised.
3. When testing an occurrence, state at least five questions to be answered to prove a violation.
4. Identify the point of observation of a plume for visible emission evaluation.
5. Differentiate between water vapor and particulate opacity.
6. Demonstrate how to properly document a visible emission violation.
7. Explain the meaning of a "certified smoke reader".
8. Define "opacity".
9. Explain the Ringelmann chart method of determining smoke density.

LESSON PLAN (CONT'D)

LESSON 4

10. From a set of opacity readings, determine compliance or violation with a given set of regulations.

11. Identify some of the more simplified evaluation by effects, such as:

    * adhesive captures of nuisance particles

    * use of high volume sampler

    * effect on sampling materials

    * damage to plants and materials.

STUDENT PREREQUISITE SKILLS.	Attendance at preceding lectures of this course. Familiarity with EPA Method 9, Visual Determination of the Opacity of Emissions from Stationary Sources, is beneficial. Attendance at a Visible Emission Evaluation training school or some field experience in reading plume opacity would be helpful.
LEVEL OF INSTRUCTION.	This lesson begins to deal with the specifics of how the FEO does his job. It is still non-technical in character but presents the details of field operations. Practices differ among agencies and students should learn from each other as well as the lecture text, and then judge the value of their own methods compared to others.
INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	No special professional background required.
SUPPORT MATERIALS EQUIPMENT LISTS.	35 mm Slide Projector and Screen 35 mm Slides Blackboard
SPECIAL INSTRUCTIONS.	The theme might be that the record and documentation of every observable violation must be created in such a manner as to become the foundation for a case whether or not legal prosecution follows. The instructor should have some experience in "reading" the opacity of plumes in the field.

LESSON PLAN (CONT'D)

LESSON 4

SELECTED REFERENCES.

1. EPA Standards of Performance for New Station Sources, Appendix A, Method 9. See Code of Federal Regulations, 40 part 60. Reference 8.
2. Air Pollution Effects Surveillance, Chapter 10, Vol. III, Ed. 3 of Air Pollution, Stern Editor, C. W. Gruber and G. Jutze, authors, Academic Press 1976. Reference 9.
3. ARB Enforcement Symposium, Sacramento, Calif. Sept. 14-16, 1977, Criminal Actions by A. H. Segal, Director Enforcement, South Coast Air Quality Management District. Reference 10.
4. EPA-450/3-78-005, Handbook "Diagnosing Vegetation Injury Caused by Air Pollution", Office Air Quality Planning and Standards, Research Triangle Park, NC, 1978. Reference 11.
5. Guide lines for Evaluation of Visible Emissions, Certification, Field Procedures, Legal Aspects and Background Material. EPA-340/1-75-007. April, 1975. Reference 12.
6. EPA SI Course #448 "Diagnosing Vegetation Injury caused by Air Pollution". Reference 13.
7. EPA-450/3-78-105 and EPA-450/3-78-106 Instructor and Student Manual, APTI Course #439, "Visible Emissions Evaluation". Reference 35.

AIR POLLUTION TRAINING INSTITUTE

CONTENT OUTLINE

(TIME SCHEDULE)

Course: 444
Lecture Title: OFF-SITE SURVEILLANCE, OPACITY, DOCUMENTATION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 1

NOTES

		Time of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	SURVEILLANCE PRINCIPLES	2	4
III.	DISTRICT SURVEILLANCE	2	6
IV.	PRE-INSPECTION SURVEILLANCE	2	8
V.	SURVEILLANCE BY INSTRUMENTS AND EFFECTS INDICATORS	6	14
VI.	ENFORCEMENT OF VISIBLE EMISSIONS	8	22
VII.	DOCUMENTATION OF A VISIBLE EMISSION VIOLATION	3	25
VIII.	TYPES OF EVIDENCE	3	28
IX.	TESTIFY TO OPACITY	2	30
X.	ESTABLISHING THE PRIMA FACIA CASE	2	32
XI.	STUDENT EXERCISE No. 1 - SECTION I	58	90

APTI AIR POLLUTION TRAINING INSTITUTE

CONTENT OUTLINE

Course: 444
Lecture Title: OFF-SITE SURVEILLANCE, OPACITY, DOCUMENTATION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 9

NOTES

I. INTRODUCTION

IRM p. 4-1

State lesson goal.

II. SURVEILLANCE PRINCIPLES

SM p. 4-2

Surveillance means to "watch over".

- An assigned district by patrolling.
- Prior to entering a source facility for inspection.
- A limited area with instruments and effects indicators.

A. Purpose

To find by sensory perception (see or smell) a manifestation of a violation of the rules and regulations or of a potential violation. At times, simplified instruments of effects indicators are needed to prove an ambient violation or assist in a complaint investigation.

B. Observable Manifestations of Violations

- Plumes of readable opacity.
- Fugitive emissions from source operations such as materials handling, quarrying, crushing, construction, demolition, etc.
- Large particle fallout.
- Evidence of plant damage.
- Obnoxious odors, especially if citizen complaint has been received.
- New facility construction expansion or modification for which a permit may not have been obtained.
- Open fires where prohibited.
- Change of ownership without new owner obtaining a required certificate of operation.
- Illegal fuel delivery where fuel use is regulated.

CONTENT OUTLINE (CONT'D)

LESSON 4

III. DISTRICT SURVEILLANCE

SM p. 4-2

Is carried out

A. By having the FED spend a part of his day on "patrol".

B. Exercising surveillance when in the field on other assignments, going from job to job.

IV. PRE-INSPECTION SURVEILLANCE

SM p. 4-3

A. Prior to entering a facility for inspection.

B. How is surveillance accomplished?

By seeking out a vantage point or driving around the facility. Do this safely. Do not drive and look - park and observe.

V. SURVEILLANCE BY INSTRUMENTS AND EFFECTS INDICATORS

SM p. 4-4
Slide 4-1

A. Hi-volume sampler
Used to show compliance with or violation of Ambient Air Quality Standard for suspended particulates. Locate upwind and downwind to show source impact.

B. Ambient Adhesive Impactor

Slide 4-2

Used successfully to show nuisance particles larger than 20 μ.

Slide 4-3
Slide 4-4
Collecting paint overspray

C. Effects Indicators

Show vegetation effect.

Slide 4-5

Indicator materials as lead-based paints

Slide 4-6

VI. ENFORCEMENT OF VISIBLE EMISSIONS

SM p. 4-4

A. Opacity

* Define opacity as the degree to which transmitted light is reduced.

Example: 40% opacity reduces the light transmitted through the plume by 40%.

CONTENT OUTLINE (CONT'D)

LESSON 4

- Opacity regulation limits the discharge of very small particles. It is not fundamentally related to mass particulate concentration.
- Visible emission regulation is nearly universal.
- EPA Method 9 is most widely accepted reference method.
- State and local regulations may contain both opacity and Ringelmann chart.

Slide: 4-7
Figure: 4-2
Sm.p. 4-8

Question student FEO's.

How many have opacity regulations which specifically refer to Method 9?

How many have both Opacity and Ringelmann Number?

Challenge students to actually quote regulation number or section number, time and other wording.

B. Structure of a Plume

Fig. 4.1
SM p. 4-5

Point out:

- Point of release
- Body of plume
- Point of dissipation
- Detached plume
- Reading wet plumes at point of dissipation

C. Rules for reading opacity
(Question and answer format.)

Slide 4-8, 4-9,4-1
SM p. 4-5
Figures 4-3,
4-4 and 4-5

1. What should be the observer's position?
    - Sufficient distance to provide a clear view.
    - The sun is oriented in the 140 degree sector to his back.
    - Line of vision is approximately perpendicular to direction of plume.

Structure of a Plume

Sm.p 4-6

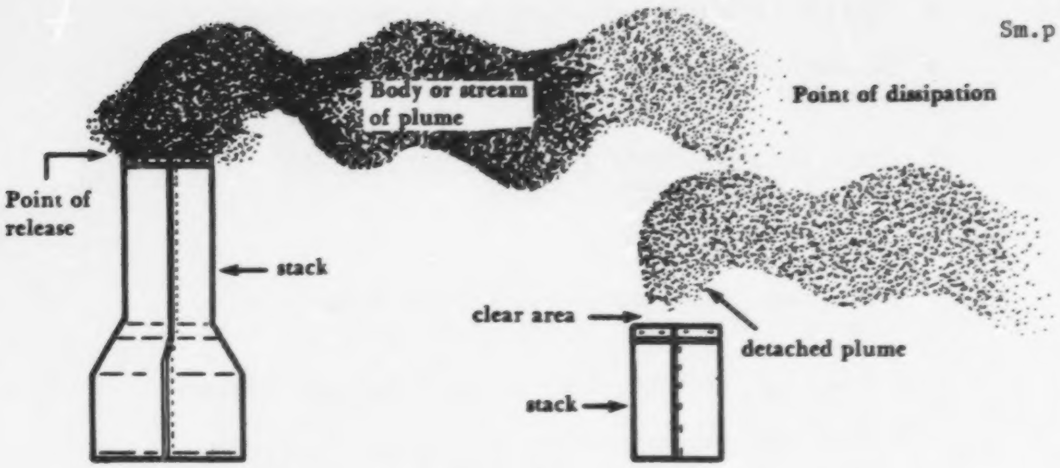

Body or stream of plume
Point of dissipation
Point of release
stack
clear area
detached plume
stack

Figure 4-1. General structure of continuous and detached plumes.
(Source: Weisburd, Reference 3)

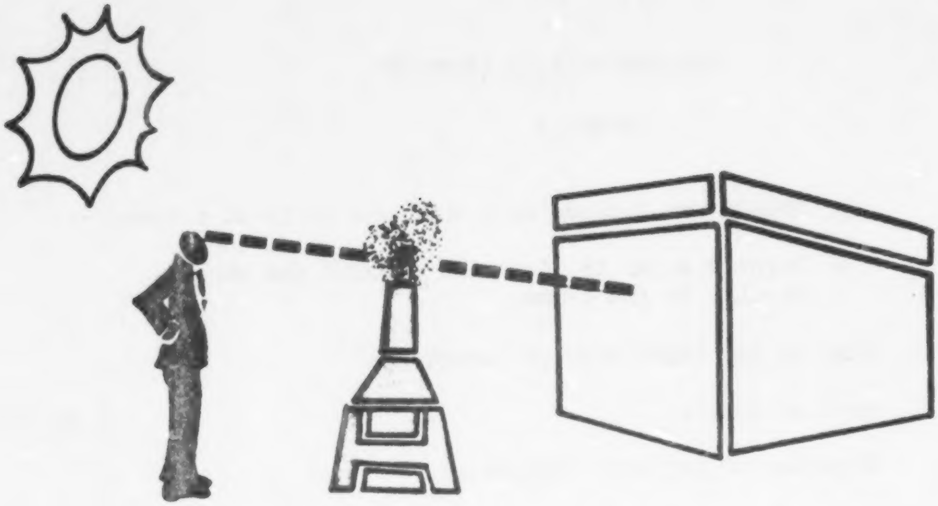


Figure 4-3. Light source should emanate from the rear of observer during daylight hours (reflected light).

Sm.p 4-10

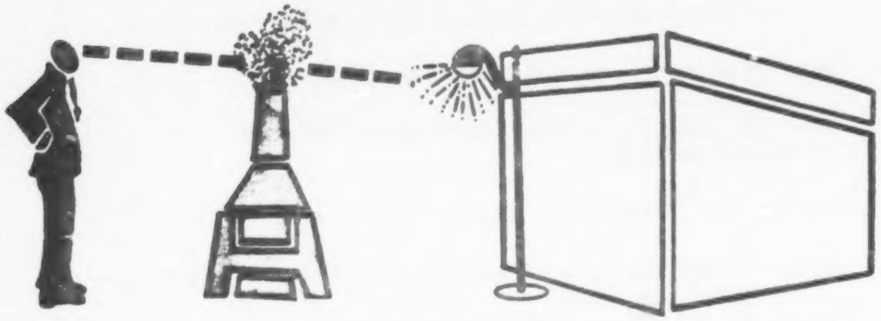


Figure 4-4. During darkness, the light source should emanate from behind the plume, opposite the observer (transmitted light).

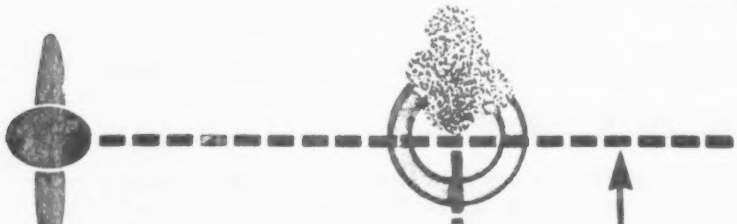


Figure 4-5. Readings should be made at right angles to wind direction and from any distance necessary to obtain a clear view of stack and background.

(Source: APTD-1100 Reference 4)

CONTENT OUTLINE (CONT'D)

LESSON 4

- * Should not include more than one plume at a time.
- * Perpendicular to direction of wind and perpendicular to the plume.

2. What is the importance of background?

Need contrast. SM 4-24

Bias due to variable background.

Tests by EPA indicate possibility of

(a) positive bias (reading denser than actual) is greatest with greater contrast in background.

(b) negative bias (reading lighter than actual) is greatest with non-contrasting background.

3. Does observer look continuously at plume?

No. He glances at plume and reads once in 15 second intervals.

4. How do you "read" wet plumes?

Where condensed water vapor dissipates, or where it leaves the stack.

5. Where in the plume does he judge the opacity?

Just above the stack outlet where plume has highest opacity. For wet plumes see Q4.

6. Why should observer's sight line be perpendicular to plume?

Must look across the plume to get true opacity

D. Types of Opacity Regulations SM 4-18

1. Opacity averaged over a specified time period - six minutes in the current Method 9.
2. Any time the opacity is in violation is totaled and compared to the regulation limit after deducting allowances or exceptions.

CONTENT OUTLINE (CONT'D)

LESSON 4

VII . DOCUMENTATION OF THE VISIBLE EMISSION VIOLATION

SM p. 4-11

Pass up if time is short.

Name of source and location.

Emission location, i.e., specific stack, building or other concise identification.

Date

Time (Including beginning and end of observation)

Degree of opacity

Orientation of observer, sun and emission point

Estimate of distance, observer to emission point

Approximate wind direction

Estimate of wind speed

Temperature and humidity, especially if a wet plume is involved.

Description of sky (color or presence of clouds)

Color of visible emissions

Background, if other than sky

Name and title of observer

Important: If physical conditions prevent making the observation according to specified conditions, notes should be made to justify the accuracy of the reading and perhaps marginal opacities should not be included in the time summary.

Note: Most agencies have a form for recording of an opacity reading which includes the necessary information.

SM 4-25

Sketch.

CONTENT OUTLINE (CONT'D)

LESSON 4

VIII. TYPES OF EVIDENCE

1. Testimonial
2. Demonstrative
3. Presented by Expert Witness

A. Testimonial

A direct statement of what he saw and all supporting conditions relating the event to the regulation.

Reciting the Documentation of the Violation.

See Section X below.

B. Demonstrative

Physical evidence to support testimonial.

Example: Samples of damaged vegetation, samples of fuel, photographs.

C. Expert Witness testimony

Covered in Lesson 9.

Opacity testimony is given as an expert witness.

IX. TESTIFYING TO OPACITY

SM p. 4-14

* The FEO is trained to read opacity by judgment (eye-balling).
* He is certified by successfully completing a "course" of opacity readings at a smoke school, or
* Is otherwise trained in reading opacity.
* The FEO testifies at hearings or in court as an expert witness.
* As an expert witness, he must be qualified as such before giving testimony.

It is absolutely essential when testimony on opacity is to be given that the FEO be able to describe in some detail (especially under cross-examination) the procedures by which he was qualified to make opacity (or density) readings.

CONTENT OUTLINE (CONT'D)

LESSON 4

X. ESTABLISHING THE PRIMA FACIE CASE

SM 4-11

Applicable to court prosecution in a criminal case (misdemeanor penalties)

A. "Prima facie" - legally sufficient to establish a case (violation) unless disproved.

B. Every element of the rule violated must be proven.

Example: If the opacity rule alleged to have been violated states:

SM 4-12

"a person shall not discharge into the atmosphere from any single source . . . . any air contaminant" of any particular quality or quantity for more than the maximum permissible time specified, it must be proven that:

(1) a person (2) discharged (3) into the atmosphere (4) from a single source (5) a contaminant (6) of the quality prescribed (opacity or density), (7) for more than the time specified.

If a single element is missing, the violation has not been established and there is no case.

XI. STUDENT EXERCISE NO. 1

Explain Exercise

Go to Lesson Plan

IRM p. 4-15 and

Student Workbook p. 1-2

Lesson 4, Section I.

Henderson County Ohio Opacity Violation.

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: STUDENT EXERCISE NO. 1
CASE STUDY
HENDERSON COUNTY - OPACITY VIOLATION AND INSPECTION
LESSON 4 - SECTION I
LESSON 5 - SECTION II
COURSE: 444
LESSON TIME:
PREPARED BY: C. W. Gruber
DATE: 1/19/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

EXERCISE GOAL. Practice in application of principles taught during the day.

EXERCISE OBJECTIVES. At the end of this exercise, the student should have demonstrated his ability to:

1. Read and apply rules and regulations which are not familiar to the student.
2. Objectively determine, from given data on a series of opacity readings that a violation, in fact, has occurred and relate such observation to the Rule or Regulation violated.
3. Write a notice of violation of visible emission rule.
4. Write a pre-entry inspection strategy statement.
5. Identify errors in a poorly conducted on-site inspection.
6. Identify all potential violations discovered during the on-site inspection.
7. Write a report documenting the on-site inspection.

SUPPLY MATERIAL EQUIPMENT LISTS.
Case Study and Student Response Forms in Student Workbook.
Answer Key.
Tables for working groups.
35 mm Slide projector and Screen.

SPECIAL INSTRUCTIONS. The Henderson County Incinerator case has many interesting aspects related to multiple violations, new ownership, etc. Best practice would be to assign groups of three (or four to balance out the class), attempting to mix experienced and inexperienced students in the same group. Also try to have different agencies represented in the same group.

LESSON PLAN (CONT'D)

STUDENT EXERCISE NO. 1

INSTRUCTIONS. The Exercise has two sections:

Section I follows Lesson 4 and Section II follows Lesson 5.

Because of the time limitations, carefully abide by the following instructions:

1. Work as a team of two or three to be assigned.
2. Read the case history and do the work called for in the case study.
3. Only one completed answer sheet is required for each Team. All members should sign to record their participation.
4. Following each Lesson (4 and 5), forty (40) minutes will be allotted to complete the answer sheets.
5. After 40 minutes, the instructor will call for reports - question by question - at random from the various Teams. The spokesman will respond.
6. Each point will be discussed.
7. At the completion of Section I and Section II, an answer sheet will be available to each student to compare against the work of his team.
8. Collection of the reports for review by the instructor is optional. If collected, the Team Reports should be returned the next day.

STUDENT EXERCISE NO. 1

SECTION I (LESSON 4)

ANSWER SHEET

TEAM Answer Key
4-1-79

MEMBERS SIGN:

1. Completed Visible Emission Observation Form. Do not turn in.

2. Enter on the Notice of Violation Form that information which is valid to this point in time.

3. The rule violated was 50 *
Aggregate (length) of violation 6 1/2 minutes

4. The on-site inspection should produce the following information to complete the documentation of this violation.

   1. Owner-Management data
   2. Equipment & permit data
   3. Operator data.

* Note: Read Rule 50b. Only 2½ minutes of No 3 or less is exempted from the total of 9 minutes of No 1 or darker. So the time of the violation is 6½ min.

VISIBLE EMISSION OBSERVATION FORM

Source Name ______________________

Observer John T Hubbard

Address ______________________

Date 7/15/78

Observation Point: 75 ft w. of source.

Stack: Distance From 75' W Height 12'

Wind: Speed 5 mph Direction S

Sky Condition: Cloudy (assumed)

Color of Emission: black

Ambient Temp: Dry Bulb 80 °F (assumed)

Wet Bulb ____ °F

Relative Humidity: ________

Observation began 0815 Ended 0828

Observer's Signature: J Hubbard

Certification Date: 4/2/78

Comments:

Location from which observation was made was the only observation point available. Since sky was cloudy, the readings are acceptable. Note that only 80% (No4) density will be included in the opacity violation duration.

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15	5	5	5	5	45				
16	5	5	5	5	46				
17	5	4	4	4	47				
18	4	4	4	4	48				
19	4	4	4	4	49				
20	4	4	4	4	50				
21	4	4	3	3	51				
22	2	2	2	2	52				
23	1	1	1	1	53				
24	1/2	1/2	1/2	1/2	54				
25	1/2	1/2	1/2	1/2	55				
26	1/2	1/2	1/2	1/2	56				
27	0	0	0	0	57				
28					58				
29					59				

Reproduced from best available copy.

ANSWER KEY 4-1-79

Henderson County Air Pollution Control
Henderson, Ohio

CORP	
PART	
INDIV	

NOTICE OF VIOLATION

7-15-78
DATE OF VIOLATION

NAME ______

ADDRESS ______ CITY ______

RE PREMISES AT ______

INSTALLING CONTRACTOR ______ CITY ______

YOU ARE HEREBY NOTIFIED THAT PURSUANT TO SECTION Rule 50 **OF THE HEALTH AND SAFETY CODE OF THE STATE OF** OHIO **A MISDEMEANOR HAS BEEN COMMITTED THROUGH THE** discharge of air contaminants of an opacity in excess of that allowed from the stack of an incinerator for a duration of 6½ minutes

POINT OF OBSERVATION: 75 ft w. of the incinerator stack

WEATHER: [✓ Cloudy]* WIND N E [✓ S] W

ARRIVAL: 08:15 AM

DEPARTURE: 08:22 AM

WAS SOURCE EMITTING VISIBLE DISCHARGE AT END OF OBSERVATION? YES ☐ NO ☑

R. No. OR OPACITY

EMISSION FROM: BASIC ✓ CONTROL OPEN FIRE

VISIBLE EMISSIONS OBSERVED

START		STOP		MIN.	R. No. % OP.	COLOR
08	15	08	17½	2¼	5	black
08	17½	08.	21½	4¼	4	black
08	21½	08	22	½	3	black
08	22	08	23	1	2	black
08	23	08	24	1	1	black
TOTAL				9		MIN.

Permit No. ______

SERVED TO ______

TITLE ______

Date of Service ______ By ______

Sector ______

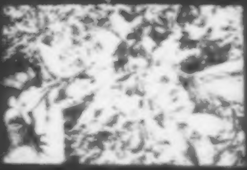
John Adams
Director of Enforcement

By John Hubbard Badge No. 35

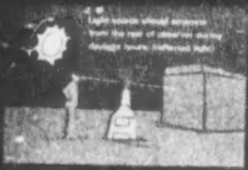
FRONT

* assumed

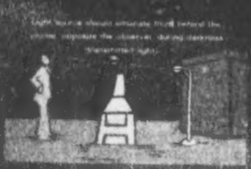
12/79 444 LESSON 4 2.



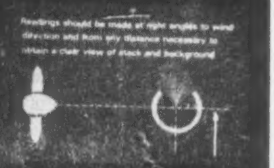
RINGELMANN'S SCALE FOR GRADING THE DENSITY OF SMOKE



Light source should emanate from the rear of observer during daylight hours (reflected light)



Light source should emanate from behind the stack, opposite the observer, during darkness (transmitted light)



Readings should be made at right angles to wind direction and from any distance necessary to obtain a clear view of stack and background

LESSON 5

ON-SITE INSPECTION OF SOURCES

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 5

ON-SITE INSPECTION OF SOURCES
(Including Student Exercise No. 1)
(Section II)

COURSE: 444
LESSON TIME: 90 minutes*
PREPARED BY: C.W. Gruber DATE: 10/1/78

*Lecture - 30 min.
Exercise Section II - 60 min.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. To teach good inspection methodology for inspection of the source premises, decision making, actions to be taken and documentation and of the result thereof.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. State the definition of "on-site inspection".
2. Define the purposes for which inspections are made.
3. Differentiate between single and multi-purpose inspections.
4. Explain pre-entry preparation.
5. Explain the steps taken to gain entry.
6. Describe the situation wherein a warrant may be necessary.
7. Explain the proper procedure for conducting an interview.
8. List the main points of source ownership identity.
9. List the important points of inspection of the process or equipment.
10. Identify the information to be supplied to the source.
11. Write a notice of violation.
12. Identify at least five essential points of an effective report.
13. Identify the several ways of serving a notice of violation.

AIR POLLUTION TRAINING INSTITUTE

CONTENT OUTLINE

(TIME SCHEDULE)
LESSON 5

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Course: 444
Lecture Title: ON SITE INSPECTION OF SOURCES

Page 1 of 1

NOTES

		Time of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	TYPES OF INSPECTIONS	3	5
III.	ELEMENTS OF THE INSPECTION PROCESS	18	23
IV.	GIVING NOTICE OF VIOLATION	4	27
V.	PREPARATION OF THE REPORT	3	30
VI.	STUDENT EXERCISE NO. 1 - PART II.	60	90

AIR POLLUTION TRAINING INSTITUTE

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Course: 444
Lecture Title: ON-SITE INSPECTION OF SOURCES

NOTES

I. INTRODUCTION

State lesson goal.

A. Practices Vary Among Agencies.

Since many of the procedures for on-site inspection, especially the serving of notices, varies between agencies, this lesson will deal largely with principles of source inspection and the documentation thereof.

B. Definition of On-site Inspection.

An on-site inspection consists of an entry on to the premises of a source facility to obtain facts and information necessary to establish compliance or non-compliance of a specific process or the entire facility with the applicable rules or regulations.

II. TYPES OF INSPECTIONS

The type of inspection relates to the reason for which the inspection is made. The terminology is assigned for ease of communication.

A. Facility Inspection

The source facility or a sub-unit is inspected for the purposes of:

1. Construction Permit Inspection

A premises is entered for the purpose of seeing that the conditions of an issued permit to construct or operate are met.

2. Cyclic Source Inspection

An inspection made according to a time cycle to qualify or disqualify a source for a renewal of an operating permit or to maintain continuing knowledge of source operation and emissions.

3. Compliance Plan Inspection

To determine the progress of a compliance plan, an administrative order or a court order.

CONTENT OUTLINE (CONT'D)

LESSON 5

B. Violation Inspection

The premises are entered following an observed violation as a result of off-site surveillance.

C. Complaint Inspection

Similar to A but relates to a complaint situation.

D. Inspections related to Emergencies

Two events trigger this type of inspection, the process upset emitting pollutants causing immediate danger, or the general alert due to prolonged adverse meteorology. The former comes on suddenly and requires instant response, while the latter may generate a high number of source inspections requiring long hours in the field.

Emergency Episode and Alert Inspections will be covered in Lesson 22.

E. Inspections might be

1. Single Purpose

Entering the premises for a single purpose as:

* To investigate an observed emission violation.

* To check a certain step in a compliance plan.

2. Multi-Purpose

Single purpose inspection might lead to multi-purpose (a real "can of worms") inspection.

A violation inspection might reveal many other conditions of non-compliance, such as:

Failure to obtain construction permit
New ownership
Expanded operation
Change in processes, equipment or raw materials
Change in fuels

Be prepared to extend from single purpose inspection to comprehensive inspection should conditions warrant.

CONTENT OUTLINE (CONT'D)

LESSON 5

III. ELEMENTS OF THE INSPECTION PROCESS

SM p. 5-4

A. Pre-entry Observation of the Source Premises

All inspections begin with a pre-entry observation of the premises for signs of visible emissions or other manifestations of non-compliance. (In the case of visible emission violation, this will have been done.)

Refer to Lesson 4 which covered pre-entry observation under the heading of Pre-inspection Surveillance.

B. Preparation for Entry

1. Review the source record by

   a. Referring to the plant record files he carries with him. (Many FEOs have data cards for their sources in their cars.)

   b. Checking the source file in the office before leaving for the field.

   c. Check source data by radio contact or land phone.

   d. Have possession of permit or compliance plan inspection forms usually available.

2. Organize your inspection plan.

   Have your reasons for the inspection and your intended procedure well organized in your head so they can be communicated to each of the persons you will contact.

   * The purpose for the inspection.

   * Who you wish to see with alternates, if your first choice is not available.

   * The order of your investigative process.

C. Entry to the Premises

The procedure described here is the usual procedure for an unfamiliar or poorly documented facility. Where the FEO is familiar with the source and certain of the correctness of his data, some of the steps may be omitted.

CONTENT OUTLINE (CONT'D)

LESSON 5

1. Normal Entry Procedure
   (Such is usually the case.)

   * Gain entry through front gate or front door of the particular facility to be inspected.

   * Identify yourself and state your business. Produce your credentials, if requested.

   * Ask for the facility manager. If known by name or title, use this.

   * Abide by company rules. You may have to wait, but you can't "shoot" your way in.

2. When Entry is Denied

   In unusual cases, entry may be denied. In this case, the FED may

   (a) Immediately change his posture. Become "tough". Example: "Your position gives me no alternative but to proceed legally against your company and I will do it. Your attitude closes all other possible enforcement routes."

   (b) Advise of possible action for "failing to grant entry". Sec. 114 of Clean Air Act or appropriate local regulation.

   (c) Obtain a search warrant. (See Lessons 7 and 8.)

D. Management Interview, How to Conduct

SM p. 5-6

* When ushered into the manager's office, identify yourself. If you are introduced by a receptionist, listen to be sure you are properly identified and correct any errors.

* State your business in concise terms.
  "I wish to inspect the construction site for the bag house, Permit No. A65." Or,
  "I have observed a 12 minute visible emission effluent from the boiler house stack and wish to investigate the cause."

* Avoid excessive small talk. A simple but cordial "good-morning is preferable to discussing the weather or last Sunday's football game.

CONTENT OUTLINE (CONT'D)

LESSON 5

- Don't be excessively accusing or berating. (No matter how mad or aggravated you are at this particular source.)

- Conserve time, your time and the manager's time.

- Know what information you want from management and where you want to go after management interview.

- Give manager time to respond and listen. What he says is important to recall. You learn nothing if you do all the talking.

- Make notes as interview progresses. If you use a recording device, be sure to reveal same and secure permission to record other voices.

- If you wish to take photographs, secure permission; such will usually be denied. Re-explain to make sure the reason for pictures. If still denied, forget about photographs and take complete notes. Perhaps sketches, if they will aid and you have this ability.

1. Management interview establishes business data, such as:

   To instructors: You may wish to do this section by conference method or give one or two examples and have students generate the rest.

   - The present legal owner
   - Type, corporation, subsidiary, partnership, individually owned
   - If a corporation, the corporate identity
   - Correct addresses of source, corporation headquarters, division headquarters, etc.
   - The nature of the business
   - Full name and title of responsible facility manager. Make sure you will be able to identify this person at a future time, if necessary.

CONTENT OUTLINE (CONT'D)

LESSON 5

- * Full name and title of person to conduct you to the site of interest.
- * The documents or plant records you wish to inspect, especially production rates and materials involved.
- * The inspection plan you wish to follow.

Caution: If the FEO already has some of this information, be sure to verify same as ownership and management changes.

E. Process Equipment Inspection — SM p. 5-7

The complexity of the facility and type of inspection being made determines time required. This part of inspection is often made with a source facility staff environmental engineer who may or may not be familiar with the investigative methods of the FEO, where it is uncomplicated as in a small industrial boiler house, the FEO may be on his own.

1. Process or Equipment Inspection

During process inspection the FEO will

- * Obtain or confirm operational responsibility with names, titles, etc.
- * Process and equipment involved, identifying by name, number or location.
- * Equipment operating schedules - check logs.
- * Control equipment and abatement measures or source reduction plans.
- * Status of compliance with permit regulations
    - + Is permit posted?
    - + Is operating permit outdated?
- * Instrumental Process Data - recorded or indicating.

CONTENT OUTLINE (CONTD)

LESSON 5

- Continuous emission monitor data.
- Be observant for signs of poor operating practice or maintenance. See Lesson 19.

F. Operator Interview — SM p. 5-7

Only for violation or perhaps complaint inspection is it necessary to interview the operator. If there is no operator in attendance, ask to interview the process supervisor or other responsible person who has personal knowledge of the process operation. Be sure, full names and titles are obtained and recorded.

Where an operator is in attendance:

- Obtain his complete identity.
- Does he normally operate?
- Was he operating or in charge when the event occurred?
- Was there a deviation from normal operating procedures?
- If so, why?
- Who instructed him to deviate?
- Note--all this while you are seeking to place responsibility.
- Who supervises the operator?

G. Drawing Conclusions — SM p. 5-7

The FEO must now draw a conclusion (form a judgment).

- The process is in compliance or in violation.

1. Non-compliance

Important to focus in on

- The specific permit condition in non-compliance.

CONTENT OUTLINE (CONT'D)

LESSON 5

* The specific rule or regulation, by section number which was violated.

* Is the violation continuing?

* The reason for non-compliance. While not germane to establishing the existence of a violation, it is important to the investigation and the successful prosecution of the case, should court action result.

* Are there unauthorized process modifications (compared to valid permits)?

2. Where breakdown or upset [illegible] claimed, determine

   * Was there, in fact, a breakdown or emergency? Do not just accept the word of the plant personnel. Probe the event. Look for signs to verify the allegations. Look for spilled product, evidence of temporary repairs or other irregularities. Check logs or recording instruments for upset conditions.

   * Do the rules provide exception? Know what the regulations provide and check the plant record.

   * Does the breakdown result from poor maintenance?

   * Was the equipment being pushed beyond its capacity to cause breakdown?

   * Are the breakdowns frequent, indicating poorly maintained or worn out equipment?

   * Was prompt, aggressive, and effective action taken to correct the condition or minimize the emission during the upset period?

   * Does the company have a plan to prevent recurrence?

H. Providing Information

SM p. 5-8

Depends upon jurisdiction policy:

Federal EPA - Say nothing.
Many Locals - Serve a violation notice.
In between - Mail notice after review of FED report.

CONTENT OUTLINE (CONT'D)

LESSON 5

IV. GIVING NOTICE OF VIOLATION

SM p. 5-9

Purpose is to officially notify the violator that one or more specific violations have, indeed, occurred.

Depends upon policy.

Some agencies say "give only the facts"

Use a letter notice.

Key elements of a violation notice (Review)

- Identification of the violator, the name and address of the company and the mailing address, if different.
- Source ownership, whether it is a corporation or private ownership (partnership or individual).
- If a governmental entity, so state.
- The name and title of the person in charge of the facility during the time of the violation.
- The date, time, location of the violation, and any other data necessary as may be required by the special circumstance of the violation.
- The name and position title of any other plant personnel (such as operator) who may share responsibility for the violation.
- Identify the statute violated by number.
- The person to whom the notice is served along with his position in the company.

A. Leaving the Premises

At completion of inspection, FEO takes a brief and friendly, if possible, farewell and leaves. Do not hang around for small talk.

V. PREPARATION OF THE REPORT

SM p. 5-9

Helpful forms are usually available.

CONTENT OUTLINE (CONT'D)

LESSON 5

Immediately upon return to car--look over data--see that you have written down all the pertinent data. It is easier to go back immediately to verify questionable notes or missing information than to try to complete by phone or re-visit later. In such cases, be sure not to show harassment or "lack of knowledge" or sloppy work.

Develop skill in report writing by

- Being objective.
- Include only what is important. (Aided by good note taking during interview)
- Remember, you may need this report at some date in the future to recall events for preparation of verbal testimony.
- Use full names and titles.
- Do not include unnecessary information which may damage your case, especially when you are uncertain about such material or such material is subjective or based on personal bias.

V. CLOSING

SM p. 5-10

Student Exercise No. 1, Section II.

SEE IRM - LESSON 4, FOR INSTRUCTIONS.

STUDENT EXERCISE NO. 1, SECTION II.

Student Workbook
p. 1-9 for
continuation of
Student Exercise
No. 1, Section II.

ANSWER SHEET FOR SECTION II FOLLOWS.

STUDENT EXERCISE NO. 1

SECTION II

LESSON 5

ANSWER SHEET

TEAM Answer Key

3-26-79

MEMBERS SIGN

____

____

____

____

1. **List at least five important errors pertaining to different principles of good on-site inspection and investigative practice.**

   1. When advised by secretary to see Mr. Peterson, he should have asked "is he the person of highest authority on the premises?" If not, who is, and ask to see that person.

   2. He should have asked Mr. Peterson's full name and official title. He may be a company officer or comptroller.

   3. As soon as Hartley Div., Compton Metals is mentioned, he should get the corporate address of Compton Metals, as well as exact corporate name, and determine relationship of Hartley Div. to Compton Metals - an operating division or wholly owned subsidiary.

   4. At the incinerator, as soon as Mr. Allen's name as plant manager was mentioned, he should get Allen's full name and title and inquire if he is on the premises now and see him before he leaves.

   5. As soon as he notes Operating Permit is issued to Johnson Storage, he should have advised of the violation of Rule 10a (Operating Without a Valid Permit) since Rule 12 states "Permits are not transferable".

   6. He should inquire about construction plans and advise of provisions of Rule 10a.

   7. The time the inspector left the premises was not stated.

   8. No information was given regarding the regulations.

STUDENT EXERCISE NO. 1

LESSON 5

ANSWER SHEET (CONT'D)

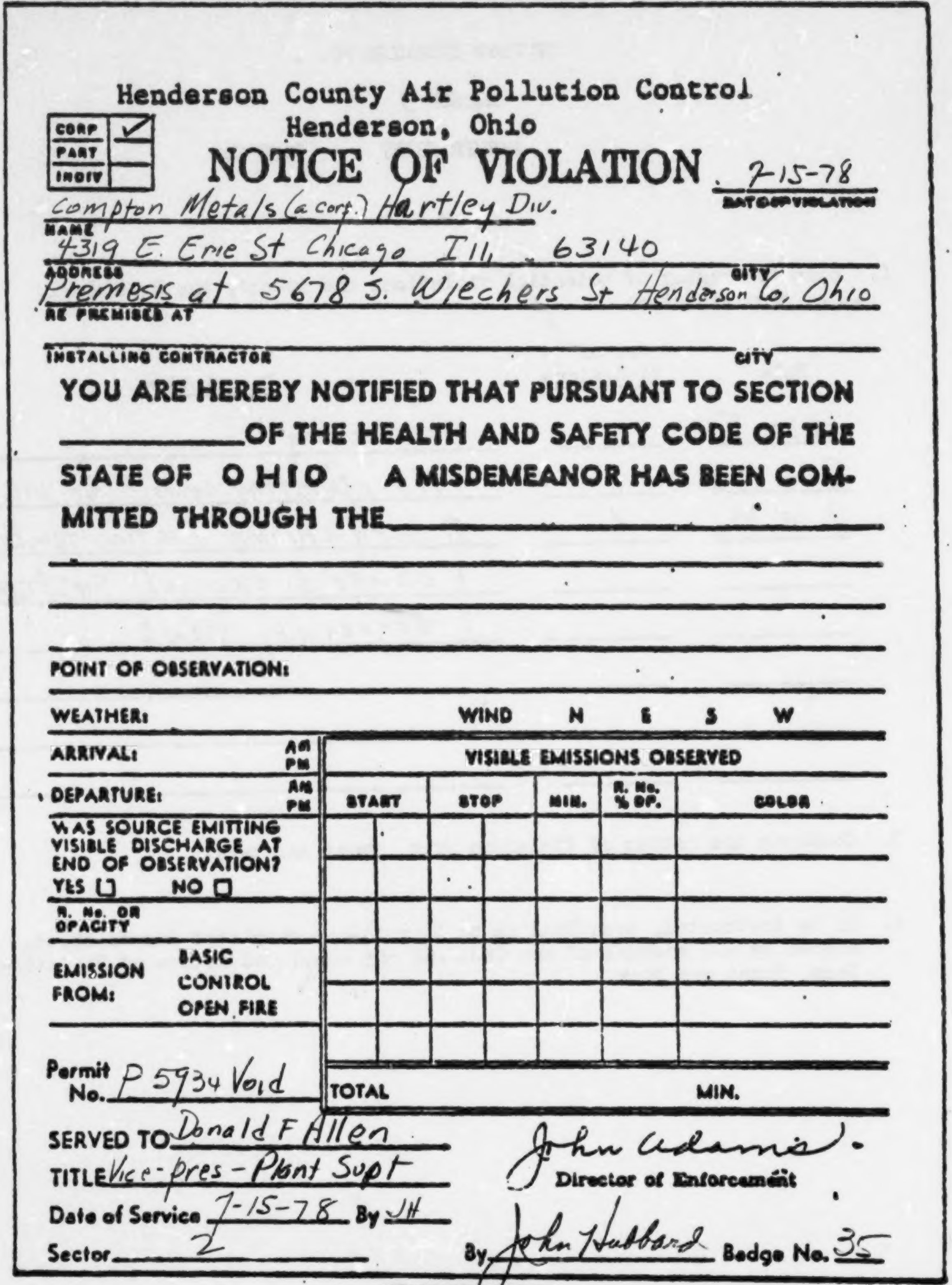
2. List the number of potential violations and specify the Rule which has been violated.

Rule	No. of Violations	Description
Rule 50	1	Opacity
Rule 10b	1	No operating permit for inc.
Rule 10a	4	2 hard chrome plating tanks
		1 blower & exhaust system
		1 degreasing tank

3. Complete the notice of Violation Form, front and back.

4. If so instructed, each Team is to turn in one completed Answer Sheet, signed by all members of the Team and one completed Notice of Violation Form, front and back.

EXAMPLE OF A PROPERLY EXECUTED NOTICE OF VIOLATION *



Henderson County Air Pollution Control
Henderson, Ohio

CORP ☑
PART ☐
INDIV ☐

NOTICE OF VIOLATION

7-15-78
DATE OF VIOLATION

NAME: Compton Metals (a corp.) Hartley Div.
ADDRESS: 4319 E. Erie St Chicago Ill. 63140 CITY
RE PREMISES AT: Premesis at 5678 S. Wiechers St Henderson Co. Ohio
INSTALLING CONTRACTOR ____________________ CITY ________

YOU ARE HEREBY NOTIFIED THAT PURSUANT TO SECTION __________ OF THE HEALTH AND SAFETY CODE OF THE STATE OF OHIO A MISDEMEANOR HAS BEEN COMMITTED THROUGH THE ____________________

POINT OF OBSERVATION:
WEATHER: WIND N E S W
ARRIVAL: AM PM
DEPARTURE: AM PM
WAS SOURCE EMITTING VISIBLE DISCHARGE AT END OF OBSERVATION? YES ☐ NO ☐
R. No. OR OPACITY
EMISSION FROM: BASIC CONTROL OPEN FIRE

VISIBLE EMISSIONS OBSERVED

START		STOP		MIN.	R. No. % OP.	COLOR

TOTAL MIN.

Permit No. P 5934 Void

SERVED TO Donald F Allen
TITLE Vice-pres - Plant Supt
Date of Service 7-15-78 By JH
Sector 2

John Adams
Director of Enforcement

By John Hubbard Badge No. 35

FRONT

*This is information added to Violation Notice after on-site inspection. This data with that filled in after observation (Lesson 4) completes the notice. It is assumed that Mr. Allen, Plant Manager, was present and was contacted by Hubbard before he left the premises.

EXAMPLE OF A PROPERLY WRITTEN REPORT *

OPERATOR
Name & Address Zachary Peterson
5678 S. Wiechers ST Henderson Co Ohio 58316

HIS REMARKS I lit the fi[illegible] this morning at about 8am. I loaded the inci[illegible] with debris left by the previous tena[illegible] 50 gallon drums of paint cans, st[illegible]king creosoted wood timbers, [illegible]aper rubber and plastic waste. Mr. [illegible] manager told me to burn th[illegible]

WAS MANAGEMENT CONTACTED [illegible]

NA[illegible] D[illegible] F Allen TI[illegible] [illegible]ce President and plant manager

HIS [illegible] asked Mr. Peterson to get rid of the debris by bu[illegible]ator. I thought the operating permit was good [illegible] cooperate with the law and will not operate the permit any more until we have our operating permit.

FINDINGS (INCLUDING INSPECTOR'S FULL EXPLANATION OF VIOLATION)

I observed emissions in excess of No 1 Ringelmann from 8:15 to 8:24 AM. After 8:24 the density reduced to No 1 and lower. The source was found to be an Acme multiple chamber retort type, 75 lb/hr, incinerator w/a Laskin gas-fired secondary burner, Slightly smouldering burning pile about 2 ft in dia. x 1 ft high was observed containing burned out paint cans and residue of rubber and plastic materials. Secondary burner was not in operation. Incinerator was not in attendance during operation observation. During plant inspection, noted 4 pieces of equipment being installed w/o permit. See separate inspection report on equipment.

CORPORATE OFFICER

DRIVER'S LICENSE NO.

VACATION FROM TO

REQUEST FOR COMPLAINT SIGNED DATE

*It is to be assumed Mr. Allen, Plant BACK Manager was present and was contacted by Hubbard before he left the premises.

Reproduced from best available copy.

LESSON 6

INSPECTION OF A CEMENT PLANT

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 6

INSPECTION OF A CEMENT PLANT
FILM AND WORKBOOK

COURSE: 444
LESSON TIME: 90 min.
PREPARED BY: C. W. Gruber
DATE: 1/19/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. To demonstrate off-site and on-site inspection procedures by depicting on film a permit status inspection of a cement plant. The student's proficiency is tested by completing inspection report forms to record conditions shown in the film.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. List the elements included in a facility inspection.
2. Describe the basic process of manufacturing Portland cement (dry process).
3. Use existing agency data to prepare for an inspection.
4. Properly obtain entry to a facility for the purpose of conducting an inspection.
5. Interface effectively with plant management and personnel so as to elicit their help and cooperation.
6. List inspection points for cement plants.
7. Examine the appropriate inspection points for permit compliance.

LESSON PLAN (CONT'D)

LESSON 6

STUDENT PREREQUISITE SKILLS	Attendance at previous lessons
LEVEL OF INSTRUCTION	This lesson, with film, will demonstrate principles covered in Lessons 4 and 5.
INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	Some job association with air pollution enforcement or related interest.
SUPPORT MATERIALS EQUIPMENT LISTS	16 mm sound movie projector and screen Film Time: "Field Inspections: Dry-type Cement Plants Running Time: 14 minutes Available from the Air Pollution Training Institute
SPECIAL INSTRUCTIONS.	Some of the material shown in the film is related to the subject of Lesson 15, Emission Control Hardware. It may be somewhat "cart before the horse" instruction but it will serve to illustrate the importance of the material to be taught in Lesson 15. Special attention is called to comments on Chapter 4 in Lesson Content, Sec. III. Instructors must preview film before showing it in this Lesson.
SELECTED REFERENCES	"Air Pollution Inspection of Cement Plants and Asphalt Batch Plants" Student Workbook, Prepared for EPA by: National Loss Control Service Corporation Note: This manual is not used as a handout to the students in this course but can be used by the lecturer as a reference. Each Area Training Center has been provided a copy. Part of the material has been used for Exercise No. 2 in the 444 course student workbook.

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 1

NOTES

TIME SCHEDULE

Course: 444

Lecture Title: INSPECTION OF A CEMENT PLANT

LESSON 6

FILM

		Time Of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	LESSON CONTENT		
III.	COMMENT ON WORKBOOK PRODUCED WITH FILM	3	5
IV.	INSTRUCTION TO STUDENTS	25	30
V.	QUESTIONS	5	35
VI.	READINESS FOR FILM	5	40
VII.	SHOWING THE FILM	20	60
VIII.	POST FILM DISCUSSION	30	90

CONTENT OUTLINE

Course: 444 LESSON 6

Lecture Title: INSPECTION OF A CEMENT PLANT FILM

NOTES

I. INTRODUCTION

State Lesson Goal.

See also Student Workbook, p. 6-3.

II. LESSON CONTENT

Centers on film showing a routine inspection of a cement plant.

1. Students observe conditions as presented in film, then fill out their own inspection report forms.
2. After completion of 1, students will compare their work with correctly filled out forms.
3. Discussion with instructor on inspection practices.

III. COMMENT ON WORKBOOK PRODUCED WITH FILM.

The film and a Trainee Workbook were made so they could be shown and studied independent of Course 444.

Because of the limited time available in this course, this film and the Asphalt Plant Inspection Film (Lesson 15) will be used to illustrate the principles of field activity being taught in this course. The film Workbook is not used in its entirety. The inspection forms and certain documents, necessary for inspection, are extracted and are found in the Student Workbook of this course, beginning on page 6-2.

IV. INSTRUCTIONS TO STUDENTS PRIOR TO SHOWING FILM. (ORGANIZATION OF VARIOUS FORMS)

A. Have students lay out forms on the table in the following order:
   1. Data Gathering Form.
   2. Cement Plant Inspection Sequence, Schematic
   3. Pictorials of Various Instrument Readings.
   4. Permit Forms.
   5. Summary of Source Operation.

CONTENT OUTLINE (CONT'D)

LESSON 6

B. After laying out forms, go over the suggested Inspection Points, item for item, referring to the Schematic. Such a procedure will familiarize the student with the process. Also point out the instrument readings needed for the starred (*) items.

Review Permit Forms and Summary of Source Operation to locate the data to be covered by the inspection so that actual inspection data can be compared to Permit Data.

Note: The instructor must, in advance, become familiar with the forms, especially the Permit Forms to assist the student in finding the data without a great loss of time.

V. QUESTIONS?

VI. READINESS FOR FILM

Have students ready to react and make their own inspection comments as the inspector in the film performs the inspection on the screen.

VII. SHOWING THE FILM

From Instructor's Manual accompanying the film.

When all students are ready and all questions disposed of, the film showing is begun.

One stop point has been provided (just following the control room inspection) for the students to record observations.

Lights go on as the students may wish to record the data from the instrument facsimile drawings in the workbook.

The instructor must use his judgment in determining the length of this stop interval by observing when the students appear to be finished.

The above is the only stop called for on the screen. There is no harm in stopping the film at other points, if this seems warranted.

CONTENT OUTLINE (CONT'D)

LESSON 6

VIII. POST FILM DISCUSSION

From Instructor's Manual accompanying the film.

After the students have had a chance to record their final observations, the session should be wrapped up with a discussion of the films and observations the students made. Data gathering forms, complete with observations as might be made by an experienced inspector, are provided at the end of this manual to assist the instructor in leading this discussion (See Answer Key). At the discretion of the instructor, these forms may be referred to only by the instructor, they may be used to create overhead transparencies for group viewing, or copies may be made and distributed to the group as hand outs. During this post-film discussion, interest should be centered on maximizing the simulation experience of the film inspections. The instructor should be careful to relate what is seen in the films to the problems and practices generally applicable to the FED's field activity.

See Answer Key that follows.

ANSWER KEY

DATA GATHERING GUIDE

CEMENT PLANT*

(Kiln and Clinker Cooler only)

THE PLANT PERIMETER

"No emissions apparent."

CONTROL ROOM INSTRUMENT READINGS*

"Clinker cooler baghouse inlet temperature reading about 360 with one acceptable excursion to 430. Lowest reading, 270, well above dewpoint. Coal mill feed rate, 8650 lbs./hr., well below maximum. Kiln feed rate, 135,000 lbs./hr., well above permit limits. Operator maintains this rate only until kiln fills."

FILM STOPS HERE

DELIVERY END OF KILN

"No leaks or emission apparent. Appears well maintained."

CLINKER COOLER ENCLOSURE

"No leaks or emissions apparent. Appears well maintained."

DUST RETURN SPOUT AND CONVEYOR

"No leaks or emissions apparent. Appears well maintained."

* Refer to the drawings at the end of this form.

CLINKER COOLER BAGHOUSE

"No leaks or emissions apparent. Well maintained except for access door clasps. Some plugged and blinded bags recently removed."

BAG CLEANING COMPRESSOR

"Operating at peak output. Well maintained."

CLINKER COOLER BAGHOUSE FAN AND MOTOR

"Motor as specified in permit. Well maintained."

CLINKER COOLER BAGHOUSE STACK

"No emissions apparent."

MULTI-CYCLONE PRE-HEATER

"No emissions apparent."

KILN BAGHOUSE ENCLOSURE AND STACK

"Visible emissions from stack, approximately 50% opacity."

Q. Should inspector have taken time and recorded an opacity violation?

Q. Should plant superintendent have been so notified?

AREA BELOW KILN BAGHOUSE

"Excessive fugitive dust from numerous small leaks."

KILN BAGHOUSE MANOMETERS*

"Overall systems pressure 11" H_2O. Cells 1, 2, 3, 5, 7, and 10 reading 8-10" H_2O. Cell 4 on cleaning cycle read minus 8". Cell 6 reading 0. Cell 7 reading 4". Baghouse apparently overloaded with high pressure overall and on operating cells, and cell 6 out."

KILN BAGHOUSE HOPPERS AND SCREW CONVEYOR

"Considerable fugitive dust from numerous small leaks. Need for repair and maintenance apparent."

KILN BAGHOUSE DUST RETURN SYSTEM

"Considerable fugitive dust from numerous small leaks. Need for repair and maintenance apparent."

KILN BAGHOUSE FAN AND MOTOR

"As specified in permit. Well maintained."

PLANT YARD

"Some evidence of recent emissions on vehicles in yard."

*Refer to the chart at the end of this form.

GENERAL DISCUSSION.

Inspector's Personal Qualities.

Q. Was he dressed professionally?

Q. Should he have had protective clothing, perhaps a jump suit or coveralls?

Q. What was your reaction to the completeness of his equipment?

Clipboard
Drawings
Hard Hat
Eye Protectors
Dust Respirator
Camera

Q. Should he have had more communication with superintendent before leaving?

Q. Was he too formal? Too informal?

Q. Do you think he related well to the specifics of the regulations during the inspection and before leaving?

Closing statement by instructor.

Do not collect student papers.

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: TEST I AND REVIEW ON DAY 1 LESSONS

COURSE: 444
LESSON TIME: 30 min.
PREPARED BY: C. W. Gruber
DATE: 1/19/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL.	To test the students on how well they absorbed Day 1 Lessons, 1 through 7.
LESSON OBJECTIVES.	At the end of this lesson the student should be able to: 1. Judge how well he absorbed the material covered in Lessons 1 through 7 dealing with THE FED - HIS JOB - HOW HE DOES IT.
SPECIAL INSTRUCTIONS.	Allow 25 minutes for the test. Collect the papers and immediately review the correct answers. Instruct students to put answers on test sheet, as well as the Answer Sheet so that they will retain their answers and can grade their own work.

ANSWER KEY

AIR POLLUTION FIELD ENFORCEMENT

COURSE #444

TEST NO. 1

33 questions - Time 25 minutes.

Circle the correct response for either True/False or Multiple Choice questions. There is only one correct answer for each question. For each wrong answer, three points will be deducted from 100 to give the test grade.

Put your answers on the answer sheet, also your name, and turn it in when completed.

Papers will be collected 25 minutes after beginning of test.

1. Air Quality Control Programs in the U.S. are prescribed by

   a. the Federal Clean Air Act alone

   b. State legislative action only

   [✓ c.] State legislative action and the Federal Clean Air Act

   d. Local regulations alone

2. The scope of a field operation program depends upon

   a. the number and types of stationary sources

   b. the agency level, i.e., local, state, federal

   c. the complexity of rules and regulations

   [✓ d.] all of the above

3. Which of the following is least related to the field enforcement process?

   [✓ a.] ambient air quality monitoring

   b. compliance plan inspection

   c. requiring periodic re-inspection of sources

   d. district surveillance

4. In proceeding from one inspection to another, it is not necessary for the FED to exercise surveillance because he is specifically assigned to source inspection. T [✓ F]

5. The term opacity means the degree to which transmitted light is reduced. [✓ T] F

6. Atmospheric particulates, larger than 20μ, can be sampled with sticky paper. [✓ T] F

7. Upon entering a plant for the first time, it is proper procedure to obtain a search warrant in advance to insure gaining entry. T [✓ F]

8. Before making an inspection for any purpose, it is considered unnecessary to

   a. consult the source file if available

   b. form a plan before entering

   [✓ c.] always phone ahead and make an appointment

   d. obtain the name of the facility contact person, if available

9. Tasks assigned to the FED most always include

   a. functioning as a working member of a source test team

   [✓ b.] investigating citizen complaints

   c. operating the ambient air quality network

   d. personally serving notices of violation

10. Which of the following are considered effective enforcement actions?

    a. filing a civil or criminal suits

    b. notice of violation with orders to abate

    c. revoking a permit to operate

    [✓ d.] all of the above

11. A source in "continuing" compliance requires minimal surveillance. [✓ T] F

12. Enforcement actions following an observed violation are left entirely to the judgment of the FED. T [✓ F]

13. Protection against the adverse effects on public health and welfare is the only goal of the Federal Clean Air Act. T [✓ F]

14. Ambient Air Quality results only from the sum of emissions from sources plus atmospheric reaction products. T [✓ F]

15. An enforcement policy guides the FED

    a. in the types of equipment subject to the permit regulations

    b. in the percent opacity which constitutes a violation

    [✓ c.] in the action he takes following an observed violation

    d. all of the above

16. Which of the following contaminants is not emitted directly from sources?

    [✓ a.] photochemical oxidants (O_3)

    b. particulates

    c. hydrocarbons

    d. carbon monoxide

17. The ultimate success or failure of the enforcement program depends heavily upon

    a. the manner of issuing a violation notice

    [✓ b.] how well the FED does his job

    c. whether the air pollution control program is state or local

    d. all of the above

18. Which of the following does not apply to the FED's job conduct?

    [✓ a.] an official vehicle must be used for field work

    b. communication is more than people talking to each other

    c. effective communications may prevent friction

    d. dress and appearance are important

19. The FED does a better job if he develops a potential for legal enforcement. [✓ T] F

20. The most important part of a newly hired FED's orientation program, during his first week on the job, is to obtain certification as an opacity observer. T [✓ F]

21. Prior to making a periodic source inspection, it is good practice to make an observation of the source exterior, even though extra time is required. [✓ T] F

22. Which of the following is not an observable manifestation of certain non-compliance during surveillance of a district?

   [✓ a.] emission of excessive carbon monoxide

   b. evidence of new construction for which no permit has been obtained

   c. plumes of readable opacity

   d. none of the above

23. Assuming you are in a remote part of your territory and you have no prior contact with a source facility, and you observe a visible emission violation from what you assume to be power house chimney, you should

   a. go back to headquarters to see if there is a record on the facility

   b. go to the facility entrance and ask to see the boiler operator

   [✓ c.] go to the facility and request to see the resident manager

   d. hope the guard at the gate does not request identification

24. In making an opacity reading, the FED should look constantly at the plume to detect changes that may occur during the observation. T [✓ F]

25. Before deciding a condition is non-compliance, the FED must relate the facts to the specifics of a rule or regulation. [✓ T] F

26. A notice of violation must be delivered in person to the highest ranking official present at a plant determined to be in violation of a control regulation. T [✓ F]

27. Where breakdown is given as a cause of violation, it is important to

   a. probe the event for signs of the emergency

   b. analyze the situation against the regulation relating to emergencies

   c. assess the frequency of breakdowns of a similar nature from this source

   [✓ d.] all of the above

28. An inspection report is always better if it is a lengthy report. T [✓ F]

29. At the initial plant inspection, you should obtain

a. the name of the secretary to the manager
b. the number of employees in the company
[✓ c.] the present legal owner of the source
d. none of the above

30. Which of the following is unnecessary in documenting a visible emission violation?

a. beginning and ending time of the observation
b. location of the source
c. position of the sun with respect to observer and source
[✓ d.] the construction permit number and date

31. After learning the rules and regulations, administrative procedures and policies, the FED is not concerned with any further training. T [✓ F]

32. When inspecting a dry type Portland cement plant, it is important to

a. record key instrument readings and relate them to permit data.
b. form judgements on fugitive dust emissions
c. form judgements on the adequacy of control equipment maintainence.
[✓ d.] all of the above

33. In a dry type Portland cement plant, a major problem is the emission of

a. hydrocarbons
b. nitrogen oxides
[✓ c.] fugitive dusts
d. all of the above

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AIR POLLUTION FIELD ENFORCEMENT
COURSE #444
TEST NO. 1

ANSWER KEY

Name KEY

1. a b [✓ c] d
2. a b c [✓ d]
3. [✓ a] b c d
4. True [✓ False]
5. [✓ True] False
6. [✓ True] False
7. True [✓ False]
8. a b [✓ c] d
9. a [✓ b] c d
10. a b c [✓ d]
11. [✓ True] False
12. True [✓ False]
13. True [✓ False]
14. True [✓ False]
15. a b [✓ c] d
16. [✓ a] b c d
17. a [✓ b] c d
18. [✓ a] b c d
19. [✓ True] False
20. True [✓ False]
21. [✓ True] False
22. [✓ a] b c d
23. a b [✓ c] d
24. True [✓ False]
25. [✓ True] False
26. True [✓ False]
27. a b c [✓ d]
28. True [✓ False]
29. a b [✓ c] d
30. a b c [✓ d]
31. True [✓ False]
32. a b c [✓ d]
33. a b [✓ c] d

TEST EVALUATION - Check one box each line. This test has been:

Too long ☐ About right ☐ Too short ☐
Too hard ☐ About right ☐ Too easy ☐

LESSON 7

BASIC FEDERAL LEGAL PROVISIONS CONSTITUTIONAL AND THE CLEAN AIR ACT

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 7
BASIC FEDERAL LEGAL PROVISIONS
CONSTITUTIONAL AND THE CLEAN AIR ACT

COURSE: 444
LESSON TIME: 30 min.
PREPARED BY: Pamela Giblin
DATE 1/19/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. To teach the federal legal provisions applicable to Air Pollution Control law and enforcement thereof, namely: (a) The principles of the Fourth, Fifth, and Fourteenth Amendments of the U. S. Constitution and (b) Introduce the principles of the Clean Air Act as amended.

Note: In depth discussion of the Federal Enforcement Program will be given in Lesson 17.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. Identify the Fourth Amendment as providing protection from unlawful search and seizure, and the limitations for gaining entry to a source premises.
2. Identify the Fifth Amendment as providing protection against self-incrimination, except for corporations.
3. Identify the Fourteenth Amendment as establishing the principles of "due process" and "equal protection".
4. Define the responsibility for enforcement of the Federal EPA, States and Local governments as applied to (a) all sources except mobile, (b) mobile sources, (c) emergencies.
5. Identify the pre-construction control under the requirements of new source review for NSPS, NESHAPS and PSD.
6. State the responsibility of the Federal EPA when States fail to enforce their SIPS. (Section 113)
7. Define "PSD" and "off-set" and where they apply.
8. Define LAER, BACT, NSPS, NESHAP and RACT.

LESSON PLAN (CONT'D)

LESSON 7

STUDENT PREREQUISITE SKILLS.	Attendance at previous lessons of this Course. Reading the text in advance is recommended.
LEVEL OF INSTRUCTION.	This lesson begins the "legal aspect" series. (Lessons 8 through 13.) The material deals with the basic federal law (Constitution and Clean Air Act) provisions which support and limit his field work. The instructor should remember that the students have had no formal legal training.
INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	No special professional background is required.
SUPPORT MATERIALS, EQUIPMENT LISTS.	35 mm Projector and Screen Slides Blackboard
SPECIAL INSTRUCTIONS.	The instructor should be a practicing lawyer preferably from the staff of a state or local control agency. A private attorney with environmental litigation experience could be used. Lessons 8 through 13 should be given by the same instructor to provide continuity. The instructor is encouraged to substitute his own case histories for those examples in the test.
SELECTED REFERENCES.	Student Text. Federal Clean Air Act

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 1

NOTES

TIME SCHEDULE

Course: 444

Lecture Title: BASIC FEDERAL LEGAL PROVISIONS
THE U. S. CONSTITUTION AND THE CLEAN AIR ACT

		Time Of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	CONSTITUTIONAL PROVISIONS	10	12
	A. The Fourth Amendment		
	B. The Fifth Amendment		
	C. The Fourteenth Amendment		
III.	THE FEDERAL CLEAN AIR ACT	15	27
	A. State Implementation Plans		
	B. Federal Enforcement		
	C. Permit Requirements		
IV.	SUMMARY	3	30

CONTENT OUTLINE

Course: 444
Lecture Title: BASIC FEDERAL LEGAL PROVISIONS - THE U. S. CONSTITUTION AND THE CLEAN AIR ACT

Page 1 of 2

NOTES

LESSON 7

I. INTRODUCTION

State the lesson goal.

The principal thrust of this lecture will be how federal constitutional and statutory provisions interface with state and local enforcement.

II. CONSTITUTIONAL PROVISIONS

SM p. 6-1 to 6-3

A. The Fourth Amendment guarantees individual freedom from unreasonable searches and seizures.

Inspection of air pollution sources and need for reasonable procedures.

Advisability of obtaining search warrant when entry denied.

B. The Fifth Amendment guarantees personal freedom from self-incrimination.

Self-reported data and its use in enforcement procedures.

C. The Fourteenth Amendment guarantees due process of law and equal protection for all citizens.

Reasonableness of regulations adopted by agency and the role of hearings in insuring due process.

III. THE FEDERAL CLEAN AIR ACT	SM p. 6-3 to 6-6
A. State Implementation Plans	FCAA Sec. 110
B. Federal Enforcement	
1. Section 113	FCAA Sec. 113
2. Section 303	FCAA Sec. 303
3. National Emissions Standards for Hazardous Air Pollutants (NESHAPS)	FCAA Sec. 112

CONTENT OUTLINE (CONT'D)

LESSON 7

C. Permit Requirements

Now much more detailed under 1977 Amendments to Clean Air Act.

1. New Source Performance Standards (NSPS) — FCAA Sec. 111

   Standards set for categories of sources.

   Enforcement of NSPS may be delegated to the states.

2. Prevention of Significant Deterioration (PSD) — FCAA Part C

   Protection of areas where the air is cleaner than that prescribed by the NAAQS requirements applicable to "major emitting facilities".

   Air quality sampling analysis must be conducted.

   Specified increments must not be exceeded.

   Best available control technology (BACT) must be applied.

   Monitoring must be conducted.

3. Emission Offsets — FCAA Part D

   Protection of areas where an NAAQS is exceeded.

   Applicable only to "major sources".

   Requirement for lowest achievable emission rate (LAER).

   Compliance by all existing sources owned or controlled by the owner or operator of the proposed source in the same air quality control region.

   Reasonable further progress (RFP) toward attainment of NAAQS.

LESSON 8

STATE AND LOCAL LAWS
AND ADMINISTRATIVE PROCEDURES

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 8

STATE & LOCAL LAWS AND
ADMINISTRATIVE PROCEDURES

COURSE: 444
LESSON TIME: 30 min.
PREPARED BY: Pamela Giblin
DATE: 12/15/78

UNITED STATES · ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. To present the source of authority for state and local control programs and the various mechanisms for achieving compliance, focusing on administrative procedures to secure compliance.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. State the source of authority for controlling air pollution within the State.
2. Differentiate between common law and statutory law, including reference to nuisance.
3. State the various strategies for processing enforcement actions through the agency and the courts.
4. Explain that neither administrative nor court orders are self-enforcing.
5. Define the process of enforcing orders.
6. State that the nature of enforcement actions is that of "adversary" which is not synonymous with "antagonistic".
7. Explain why the FED is the keystone of the enforcement process.
8. Decide whether or not to sign a "Waiver of Liability" upon entry when requested to do so by source.
9. Explain the consequences of divulging proprietary process information or confidential business records.
10. Explain how to determine if business records or process data is confidential.

LESSON PLAN (CONT'D)

LESSON 8

STUDENT PREREQUISITE SKILLS.	Attendance at previous lessons of this Course. Reading text in advance is recommended.
LEVEL OF INSTRUCTION.	Continuation of Legal Aspects Series See Lesson 7.
INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	No special professional background is required.
SUPPORT MATERIALS, EQUIPMENT LISTS.	35 mm Slide Project and Screen Slides Blackboard
SPECIAL INSTRUCTIONS.	Same as Lesson 8.
SELECTED REFERENCES.	Student Text.

CONTENT OUTLINE

TIME SCHEDULE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 1

NOTES

Course: 444

Lecture Title: STATE AND LOCAL LAWS AND ADMINISTRATIVE PROCEDURES

		Time Of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	POLICE POWER	5	7
	A. Constitutional basis		
	B. Proper foundation for valid regulations		
III.	COMMON LAW NUISANCE	5	12
	A. Original theory by which air pollution violations were pursued in the courts.		
	B. Certain advantages in areas not suited to emission limitations.		
	C. Problems associated with nuisance.		
IV.	THE STATUTORY APPROACH	5	17
	A. Advantages.		
V.	ADJUDICATORY HEARINGS	13	30
	A. Enforcement Proceedings		
	B. Permit Issuance		

CONTENT OUTLINE

Page 1 of 2

NOTES

Course: 444
Lecture Title: STATE AND LOCAL LAWS AND ADMINISTRATIVE PROCEDURES

I. INTRODUCTION

IRM 8-1

State the lesson goal.

The principal thrust of this lecture will be how state and local laws and administrative procedures originated and the evolution of enforcement theories.

II. POLICE POWER

SM p. 7-2

A. Constitutional basis

B. Proper foundation for valid regulations

III. COMMON LAW NUISANCE

SM p. 7-2
p. 7-3

A. Original theory by which air pollution violations were pursued in the courts.

B. Certain advantages in areas not suited to emission limitations.

C. Problems associated with nuisance:

1. Subjectivity
2. "Balancing of the equities"
3. General interference with the public

IV. THE STATUTORY APPROACH

SM p. 7-3

A. Advantages:

1. Objectivity and predictability
2. Once violation has been shown, no need to prove harm.

V. HEARINGS PRIOR TO REGULATION ADOPTION

Information gathering function of legislative hearings.

Adversary process not used.

CONTENT OUTLINE (CONT'D)

LESSON 8

SM p. 7-3 to p. 7-4

VI. ADJUDICATORY HEARINGS

A. Enforcement Proceedings

"Show cause" hearings.

Hearings prior to entry of Section 112 compliance orders.

B. Permit Issuance

Hearings useful in allocating air quality increment under PSD.

Burden of proof on source to show that permit requirements are met.

LESSON 9

LITIGATION PROCEDURES

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 9

LITIGATION PROCEDURES

COURSE: 444
LESSON TIME: 45 min.
PREPARED BY: Pamela Giblin
DATE: 12/15/78

UNITED STATES · ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. To describe the important aspects of the legal enforcement processes and the involvement of the FED in such cases. Proper court room procedures are taught and later demonstrated. See Lessons 11 and 12.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. Identify the various procedures used in assessing fines, penalties, injunctive relief.
2. Differentiate between civil and criminal action. Criminal misdemeanor actions resemble parking ticket cases in that generally no discovery is utilized and there is a much shorter "trial". Identify the crucial elements necessary in this expedited criminal procedure.
3. Define pre-trial discovery.
4. Define the meaning of case strategy.
5. Define "deposition".
6. Define an "interrogatory" and tell when it comes into play.
7. Identify the principal rules of evidence.
8. Differentiate between the various kinds of evidence.
9. Compare the effectiveness of direct testimony with the use of such visuals as photographs, charts, maps, etc.
10. Explain the basis for testifying as an "expert witness".
11. State at least five "Do's" and "Don'ts" for a witness when giving testimony on the witness stand.

LESSON PLAN (CONT'D)

LESSON 9

STUDENT PREREQUISITE SKILLS.	Attendance at previous lessons of this Course. Reading text in advance is recommended.
LEVEL OF INSTRUCTION.	Continuation of Legal Aspect Series, See Lessons 8 and 9.
INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	No special professional background is required.
SPECIAL MATERIALS, EQUIPMENT LISTS.	35 mm Slide Projector and Screen 35 mm Slides Blackboard
SPECIAL INSTRUCTIONS.	This lesson becomes important when the FEO is faced with enforcement by litigation. It is even more important when considering, in general, the relatively few enforcement actions which terminate in litigation. Lesson 9 details the administrative enforcement actions which are the choice of most agencies before litigation is considered. But all agencies must be prepared for strong action when administrative procedures fail to bring about compliance on a case by case basis or in general. For Federal EPA Enforcement, certain specific situations described in the Clean Air Act mandate litigation. A well trained FEO must be prepared to carry his share of the litigation process if and when it is used.

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CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Course: 444 TIME SCHEDULE
Lecture Title: LITIGATION PROCEDURES

Page 1 of 1

NOTES

		Time Of Unit Min.	Ending Min.
I.	INTRODUCTION	5	5
II.	TYPES OF LITIGATION	10	15
	A. Civil Actions		
	B. Criminal Actions		
III.	PRETRIAL DISCOVERY	5	20
	A. Deposition		
	B. Interrogatories		
IV.	PRINCIPAL RULES OF EVIDENCE	10	30
	A. Hearsay Rule		
	B. Best Evidence Rule		
	C. Leading a Witness		
	D. Do's and Don'ts for Witnesses		
V.	HEARINGS PRIOR TO REGULATION ADOPTION	5	35
	A. Information gathering function of legislative hearings.		
VI.	ADJUDICATORY HEARINGS	10	45
	A. Characteristics of adversary process		
	B. Enforcement proceedings		
	C. Compliance orders		
	D. Permit issuance		

CONTENT OUTLINE

Course: 444
Lecture Title: LITIGATION PROCEDURES

Page 1 of 2

NOTES

LESSON 9

I. INTRODUCTION

State the lesson goal.

The principal thrust of this lecture will be the basic rules of evidence and procedures for trial, with particular emphasis on the role of a witness.

II. TYPES OF LITIGATION

SM p. 8-2

A. Civil Actions

Generally seeking penalties of $50 to $1,000 per violation.

Two types of injunction available -- prohibitory injunction whereby a facility is shut down and mandatory injunction whereby a court orders a source to take corrective measures within a given time schedule and final compliance by a certain date.

B. Criminal Actions

Possible problem areas: Judges stricter in requiring that a control agency scrupulously observe constitutional rights of defendant; burden of proof is "beyond a reasonable doubt" rather than "preponderance of the evidence" as in civil cases; fines generally set so low that a violator could simply pay a fine and continue to pollute.

III. PRETRIAL DISCOVERY

SM p. 8-3

A. Deposition

1. Fishing expedition to determine what a witness knows.
2. Perpetuate the testimony of a witness.
3. "Impeach" a witness.

B. Interrogatories

Set of written questions to be answered by a prospective witness in lawsuit.

CONTENT OUTLINE (CONT'D)

LESSON 9

IV. PRINCIPAL RULES OF EVIDENCE

SM p. 8-3 to p. 8-4

A. Hearsay Rule

Prohibition against testifying as to statements which were made out of court.

Exceptions.

B. Best Evidence Rule

Evidence presented must be in best form for proving facts in question.

C. Leading a Witness

Cannot ask questions which suggest answers.

D. Do's and Don'ts for Witnesses

Most crucial point is to prepare for testimony by consultation with counsel.

V. HEARINGS PRIOR TO REGULATION ADOPTION

A. Information gathering function of legislative hearings.

VI. ADJUDICATORY HEARINGS

A. Characteristics of adversary process

B. Enforcement proceedings

C. Compliance orders

D. Permit issuance

LESSON 10

COURTROOM PROCEDURES

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 10

COURT ROOM PROCEDURES
FILM - ROLE OF THE WITNESS

COURSE: 444
LESSON TIME: 60 min.
PREPARED BY: Pamela Giblin
DATE: 12/15/78

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. To show "Role of the Witness" film, demonstrating court room procedure. Discuss lessons from the film and prepare for Case Study Exercise, "Trial of Opacity and TSP Violations, Lesson 11.

LESSON OBJECTIVE. At the end of this lesson, the student should be able to:

1. Distinguish between effective and ineffective court demeanor by an FEO as he testifies.
2. Differentiate between the kinds of testimony that can be given by the expert witness.
3. More effectively present testimony when called upon to do so.
4. Identify effective use of photographs, maps and charts in giving testimony.
5. React effectively to questioning under cross-examination by the defense attorney.
6. State the role of a Judge in the case presented in the film.

STUDENT PREREQUISITE SKILLS. Attendance at Lessons 7 through 9.

LEVEL OF INSTRUCTION The film should generate discussion and solidification of points presented in Lesson 11. The demonstration will drive home the difficulties encountered when a witness undergoes cross-examination.

LESSON PLAN (CONT'D)

LESSON 10

INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	No special professional background is required. However, the student selected should be one of the more experienced FED's and preferably has experience testifying in court.
SPECIAL MATERIALS, EQUIPMENT LISTS.	Chair for witness. Table and chair for attorney. Any notes the witness may wish to bring. Film: "Role of the Witness" (running time 40 minutes)
SPECIAL INSTRUCTIONS.	The film should be properly introduced. See Lesson Content The film requires 40 minutes to show. See Agenda for starter discussion points, but the instructor should strive to get student comment. After the film, have a brief discussion on court room procedures. After the discussion, begin preparation for mock trial in Lesson 11.

INTRODUCE FILM: THE ROLE OF THE WITNESS

The basic function of the film "The Role of the Witness" is to provide a graphic demonstration of courtroom procedures with particular emphasis on the testimony of a field enforcement officer. Students have an opportunity to observe cross-examination techniques and to see the applicability of rules of evidence in the context of particular testimony.

One of the short-comings of the movie is that it is fairly old and could be revised to present a more current type of air pollution problem. Furthermore, the movie portrays a private action rather than an enforcement action brought by a control agency. In most cases, where a field enforcement officer will be involved, the air pollution control program is the Plaintiff.

The basic benefit to be derived from the film is the portrayal of the professional and impartial demeanor of the witness. To that extent, the actor who portrays the field enforcement officer does an excellent job of showing how effective a calm and unbiased presentation can be.

LESSON 11

CASE STUDY EXERCISE
TRIAL OF OPACITY AND TSP VIOLATIONS

SEE STUDENT WORKBOOK

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 11

STUDENT DEMONSTRATION

MOCK TRIAL

COURSE: 444

LESSON TIME: 150 min.

PREPARED BY: P. Giblin
C. W. Gruber

DATE: 1/19/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL.	This lesson (exercise) is intended to provide a background against which the students may test their own ability to develop a trial strategy, both prosecution and defense, and to provide court room testimony.
LESSON OBJECTIVES.	At the end of this lesson, the student should be able to: 1. Differentiate between good and poor trial strategy. 2. Differentiate between testimony well given and poorly given.
STUDENT PREREQUISITE SKILLS.	Attendance at Lesson 10.
LEVEL OF INSTRUCTION.	This is a workshop exercise where students are asked to put into practice the principles learned in Lessons 7 through 10.
INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	No special professional background is required. Experience as an FEO is helpful.
SPECIAL MATERIALS, EQUIPMENT LISTS.	Chair for witness Table and chair for each side, one for prosecution and one for defense. Table and chair for "judge"
SPECIAL INSTRUCTIONS.	See CONTENT OUTLINE.
SELECTED REFERENCES.	Student Manual.

AIR POLLUTION TRAINING INSTITUTE

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 1

NOTES

Course: 444

Lecture Title: TIME SCHEDULE
LESSON 11

		Time of Unit Min.	Ending Min.
I.	INTRODUCTION	1	1
II.	ORGANIZATION OF STUDENT GROUPS AND ROLES	4	5
III.	CASE PREPARATION	90	95
IV.	DEMONSTRATION	30	125
V.	DISCUSSION BY CLASS	15	140
VI.	CRITIQUE BY INSTRUCTOR	5	145
VII.	SUMMATION	5	150

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CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 2

NOTES

Course: 444 LESSON 11
Lecture Title: STUDENT DEMONSTRATION

I. INTRODUCTION.

Lesson Plan

Give Lesson Objective.

II. ORGANIZATION OF STUDENT GROUPS AND ROLES

WB 11-3

Students will work in groups (teams) of 3 to 6 depending upon the number of students in the class.

When the student total is 24 or less, 4 teams will be established. Two teams, by lot, will be assigned to opacity and two teams to the TSP case, after which, by lot, the teams will be assigned prosecution or defense.

If there are more than 24 students in the class, extra teams will be formed as above and just before the trial begins, one of the duplicated teams, by lot, will be chosen to go on with the trial and one will be an observer. Thus, all teams must prepare for the mock trial. The teams are organized by the course moderator to get a mix of students on each team. The moderator will designate a team leader, selecting a more experienced person for this assignment.

The teams are to organize as follows:

Prosecution	Defense
1 chief prosecutor	1 defense attorney
1 FEO	1 technical adviser
1 chief of enforcement	1 assistant defense attorney

The other persons are assigned roles as desired by the team leader.

III. CASE PREPARATION.

WB 11-4

See Student Workbook.

IV. DEMONSTRATION.

WB 11-5

See Student Workbook.

CONTENT OUTLINE (CONT'D)

LESSON 11

V. DISTRIBUTION OF ACTUAL TRIAL QUESTIONS AND INJUNCTION.

After mock testimony is complete: distribute actual trial questions, the Facsimile of Mandatory Injunction and open for discussion.

VI. DISCUSSION BY CLASS. WB 11-6

VII. CRITIQUE BY INSTRUCTOR. WB 11-6

VIII. SUMMATION.

LESSON 12

OVERVIEW OF THE FEDERAL EPA ENFORCEMENT PROGRAM

LESSON PLAN

AIR POLLUTION
TRAINING INSTITUTE

TOPIC: LESSON 12

OVERVIEW OF THE FEDERAL EPA ENFORCEMENT PROGRAM

COURSE: 444
LESSON TIME: 75 min.
PREPARED BY: C. W. Gruber DATE 11/25/78

LESSON GOAL. To present the Federal EPA Enforcement Program as directed by the Clean Air Act and how this enforcement interacts with State and local air pollution enforcement.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. Compare the enforcement responsibilities of the Federal EPA with that of State and local agencies.
2. Name the sections of the CAA which pertain to EPA enforcement responsibilities.
3. Explain how the EPA discretionary enforcement power was limited by the 1977 Amendments.
4. Define two sources of information that trigger a Section 113 action.
5. Name four conditions which must be met before a Delayed Compliance Order can be issued.
6. Explain the various steps required to process and review a Section 113 action.
7. State which Federal Agency represents the EPA in litigation matters.
8. Name the three types of penalties provided by the CAA.
9. State the percent of sources audited by the Federal enforcement program.

LESSON PLAN (CONT'D)

LESSON 12

STUDENT PREREQUISITE SKILLS	Attendance at previous lectures.
LEVEL OF INSTRUCTION	The lesson broadly describes the Federal enforcement program.
INTENDED STUDENT PROFESSIONAL BACKGROUNDS	No special professional background is required.
SUPPORT MATERIALS EQUIPMENT LISTS	None, unless the instructor specifically request it.
SPECIAL INSTRUCTIONS	The instructor should: Currently be involved with Federal enforcement, either legally or technically, preferrably in the EPA Region in which the course is given. Use references to personal experiences and case histories of enforcement actions. Comment specifically on procedures used in the EPA Region of the course with respect to State notification of audit inspections. Comment on citizen suits if he has personal experience with the same. Update any lecture material that is changed by EPA policy or by a change in the law or regulations.
SELECTED REFERENCES	The Clean Air Act, Sections 113 and 114 and Parts C and D.

CONTENT OUTLINE

Course: 444
Lecture Title: TIME SCHEDULE
LESSON 12

Page 1 of 1

NOTES

		Time of Unit Min.	Ending Time Min.
I.	INTRODUCTION	5	5
II.	INTERFACE WITH STATE AND LOCAL ENFORCEMENT	3	8
III.	PROVISIONS OF THE CAA WHICH DIRECT FEDERAL ENFORCEMENT	2	10
IV.	CLEAN AIR ACT ENFORCEMENT PROCEDURES	10	20
V.	PROCESSING SECTION 113 ACTIONS	25	45
VI.	PENALTIES	5	50
VII.	AUDIT BY EPA OF STATE SOURCE INSPECTIONS	5	55
VIII.	QUESTIONS FROM STUDENTS RE: EPA, STATE AND LOCAL ENFORCEMENT MATTERS. If no questions are forthcoming, Speaker to give case histories.	15	70
IX.	SUMMARIES	5	75

CONTENT OUTLINE

Course: 444 Lesson 12
Lecture Title: OVERVIEW OF THE FEDERAL EPA ENFORCEMENT PROGRAM

Page 1 of 3

NOTES

I. INTRODUCTION

State the lesson goal.

Lesson Plan

State that Principles of the CAA were presented in Lesson 7.

The principal thrust of this lecture will be----- How Federal enforcement works and how it interfaces with State enforcement.

II. INTERFACE WITH STATE AND LOCAL ENFORCEMENT

SM p. 10-2

A. States and local governments have primary responsibility for prevention and control of air pollution at its source.

Modification of "primary" by the CAA Amendments.

B. Enforcement of SIP's are:

- unilaterally State;
- Federal EPA together with State;
- unilaterally Federal.

III. PROVISIONS OF THE CAA WHICH DIRECT FEDERAL ENFORCEMENT

SM p. 10-2

Section 113, Feferal Enforcement.

Section 114, Inspections, Montioring, and Entry.

Part C - Prevention of Significant Deterioration of Air Quality.

Part D - Plan Requirements for Nonattainment Areas.

The main thrust of this lecture will be Section 113 procedures.

Parts C and D were covered in Lesson 7.

CONTENT OUTLINE (CON'D)

LESSON 12

IV. CLEAN AIR ACT ENFORCEMENT

SM p. 10-3

A. Federal Enforcement Prior to the 1977 CAA Amendments.

B. Congressional Concerns with the 1970 Law.

C. Changes in Enforcement due to the 1977 Amendments.

- EPA enforcement discretion restricted.
- Existing consent decrees voided. Sec. 113 (d) (12)
- Limitation on administrative orders.
    - Section 113 orders prior to 1977. Sec. 113 (a)
    - Delayed Compliance Orders Sec. 113 (d)
    - Special Section 113 orders
        - Shut downs
        - Innovative technology Sec. 113 (d) (4)
        - Conversion to coal Sec. 113 (d) (5)

V. PROCESSING SECTION 113 ACTIONS

SM p. 10-4

Section 113 actions are triggered by:

Compliance status reports made by the States.

EPA field inspection reports.

Cite case histories for emphasis.

Letter notice is sent.

If available, recite from an actual order issued.

Informal conference usually follows

After conference, order is sent.

Review process before EPA gets into court.

SM p. 10-4

Cite a case history.

VI. PENALTIES

SM p. 10-4

Criminal

Civil

Administrative

CONTENT OUTLINE (CONT'D)

LESSON 12

VII. AUDIT BY EPA OF STATE SOURCE INSPECTIONS

SM p. 10-6

EPA makes a ten percent audit

Instructor, please comment on the procedure used by your Region interfacing with the State source inspection program, or

Present the EPA policy on audit inspections if it differs from that stated in the Manual.

VIII. QUESTIONS FROM STUDENTS RE: EPA, STATE AND LOCAL ENFORCEMENT MATTERS.

If no questions are forthcoming, Speaker to give case histories.

IX. SUMMARIES

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

TOPIC:

LEGAL TEST AND REVIEW

TEST II

COURSE: 444
LESSON TIME: 30 min.
PREPARED BY: Pamela Giblin
DATE: 1/19/79

LESSON GOAL. To test students on how well they absorbed legal lessons, 8 through 12.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. Judge his knowledge of legal aspects of the FEO's job by scoring his answer sheet as the instructor gives the right answers and discusses the points of the test.

SPECIAL MATERIALS, EQUIPMENT LISTS.

Test questions.
Correct Answers.
Grading Key.

SPECIAL INSTRUCTIONS. Allow 25 minutes for the test. Collect the papers and immediately review the correct answers.

Instruct students to put answers on test sheet, as well as the Answer Sheet so that they will retain their answers and can grade their own work.

AIR POLLUTION FIELD ENFORCEMENT

COURSE #444

TEST NO. 2

25 questions - Time 25 minutes.

Circle the correct response for either True/False or Multiple Choice questions. There is only one correct answer for each question. For each wrong answer, four points will be deducted from 100 to give the test grade.

Put your answers on the answer sheet, also your name, and turn it in when completed.

Papers will be collected 25 minutes after beginning of test.

1. Which of the following is to be considered in determining the legality of a regulation for the control of emissions?

    a. the emission inventory

    b. opacity standards

    [✓ c.] legislative authority to adopt

    d. the Hearsay Rule

2. Which of the following is common to both administrative and court proceedings?

    [✓ a.] evidence presented must be relevant

    b. a jury may be used to decide the facts

    c. relaxing of strict rules of evidence

    d. circumstantial evidence is preferable to direct evidence

3. Which of the following relates directly to the admissibility of evidence in a court trial or administrative hearing?

    a. Hearsay rule

    b. Relevancy

    c. Best evidence rule

    [✓ d.] All of the above

4. Which of the following is not good advice for a witness about to testify in court?

   a. think before responding to a question

   b. speak slowly and distinctly on the witness stand

   c. Refuse to be ashamed or startled into giving an answer you did not intend to give

   [✓ d.] memorize your testimony so you will forget none of the details

5. Which of the following is good advice for a witness about to testify in court?

   a. Read directly from your notes - you will be more accurate

   b. expand upon the facts to give interpretations of the attorneys' questions

   [✓ c.] Never hesitate to frankly admit that you do not remember a certain physical fact

   d. If you are testifying as an expert witness, do not hesitate to give long and detailed accounts of your accomplishments so as to impress the judge or jury.

6. Expert witnesses may rely on hearsay in forming opinions within the area of their expertise. [✓ T] F

7. Before a nonexpert witness can testify in a courtroom proceeding, he must testify as to his education, background, and training. T [✓ F]

8. The formal rules of evidence consider a photograph better evidence of a given situation than the eye witness testimony of an observer. T [✓ F]

9. If a witness gives testimony in a non-jury courtroom proceeding which violates a rule of evidence, the judge will refuse to consider the specific testimony in deciding the case. [✓ T] F

10. Under the Federal Clean Air Act of 1967, as amended in 1970 and 1977, the Federal Government has primary responsibility for the enforcement of emissions standards for existing stationary sources. T [✓ F]

11. It is considered unethical for an air pollution control officer to consult with his attorney before testifying in a courtroom or administrative proceeding. T [✓ F]

12. When an agency successfully obtains a court order that includes a strict compliance schedule, everyone in the agency can relax because now the violation, with certainty, will be abated. T [✓ F]

13. As a prosecuting (plaintiff) witness to an opacity violation court case, your testimony is

   a. immune from cross-examination
   [✓ b.] given as direct testimony of the violation
   c. valid because you are a field enforcement officer
   d. valid only if you present a photograph of the emission

14. The authority to control air pollution in a state or local agency must be provided by the:

   a. Governor
   [✓ b.] State legislature
   c. EPA
   d. President

15. Under Prevention of Significant Deterioration (PSD), Federal review of new construction permits for major sources is not required

   a. in attainment areas touching a non-attainment area
   b. in non-attainment areas
   [✓ c.] where sources have an emission potential of less than 100 tons per year in non-attainment areas
   d. where the emission potential is 300 tons per year.

16. When prosecuting a violation of an emission standard, it is also necessary to prove injury to public health. T [✓ F]

17. Founding air pollution control legislation on need to protect public health is constitutionally valid. [✓ T] F

18. In a criminal action, the violation is proven by presenting a preponderance of the evidence. T [✓ F]

19. A deposition serves as

   [✓ a.] a fishing expedition to try to determine what the witness knows
   b. a report by the FED to his superior
   c. a violation of large particulates falling on a residence
   d. a summation of the case by the defense attorney

20. Good case preparation should discover the evidence either side will present in court. [✓ T] F

21. The 1977 Clean Air Act Amendments require enforcement action to be taken where there is a proven SIP violation. [✓ T] F

22. A so-called Section 113 action begins with EPA presenting to the violating source, a compliance order. T [✓ F]

23. The filing of a suit in court immediately follows when the EPA Washington legal staff approves the action. T [✓ F]

Two constitutional amendments, the Fourth and the Fourteenth provide the guarantees stated in questions 24 and 25. Circle the amendment which applies to each guarantee.

24. Guarantees due process of law and equal protection. 4th [✓ 14th]

25. Guarantees freedom from unreasonable search and seizure. [✓ 4th] 14th

AIR POLLUTION FIELD ENFORCEMENT

COURSE #444

TEST NO. 2

Name ANSWER KEY

1. a b [✓ c] d
2. [✓ a] b c d
3. a b c [✓ d]
4. a b c [✓ d]
5. a b [✓ c] d
6. [✓ True] False
7. True [✓ False]
8. True [✓ False]
9. [✓ True] False
10. True [✓ False]
11. True [✓ False]
12. True [✓ False]
13. a [✓ b] c d
14. a [✓ b] c d
15. a b [✓ c] d
16. True [✓ False]
17. [✓ True] False
18. True [✓ False]
19. [✓ a] b c d
20. [✓ True] False
21. [✓ True] False
22. True [✓ False]
23. True [✓ False]
24. 4th [✓ 14th]
25. [✓ 4th] 14th

TEST EVALUATION - Check one box each line. This test has been:

Too long ☐ About right ☐ Too short ☐

Too hard ☐ About right ☐ Too easy ☐

LESSON 13

COMPLAINT HANDLING
ODOR COMPLAINT CASE STUDY

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 13
COMPLAINT HANDLING
ODOR COMPLAINT CASE STUDY

COURSE: 444
LESSON TIME: 75 min.
PREPARED BY: C. W. Gruber
DATE: 1/20/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL.	To teach the principles of processing nuisance complaints with emphasis on the field investigation process.
LESSON OBJECTIVES.	At the end of this lesson, the student should be able to: 1. Differentiate between good and poor complaint investigative procedures. 2. Document the procedure for investigation and case development. 3. Design an odor surveillance plan for a suspected source. 4. Differentiate between a public and private nuisance. 5. Define the various steps in getting action from the source management to abate the cause of the complaint.
STUDENT PREREQUISITE SKILLS.	Attendance at previous lessons.
LEVEL OF INSTRUCTION.	No formal lecture on Complaint Handling is given. A case study from the files of an Air Pollution Control Agency is used as a vehicle for self study and class discussion to develop the principles of good practice in complaint investigation.
INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	No special background is required some experience in handling complaints prior to entering the course is helpful.

LESSON PLAN (CONT'D)

LESSON 13

SUPPORT MATERIALS, EQUIPMENT LISTS.

35 mm Slide Projector and Screen
35 mm Slides
Blackboard

SPECIAL INSTRUCTIONS:

An odor complaint case study, developed from the files of a State Air Pollution Control Agency, is assigned to the students for study at the conclusion of the previous day. The Case Study is in the Student Workbook, identified as Lesson 4, Odor Complaint Case Study.

The study contains a narrative of the actions of a rather inexperienced FEO, following his assignment to respond to a citizen complaint of odor.

At the conclusion of the narrative, each student is requested to:

1. Critique the investigative actions of the FEO.
2. Develop his own approach to establishing a bona fide air pollution case.

By reading the case history and reviewing the material on Complaint Handling in the Student Manual, each student should prepare himself to enter into the class discussion, lead by the instructor during the first lecture period of Day 3 of the Course.

The instructor uses the "Answer Key" to lead the discussion and call for responses from the students.

At the conclusion of the discussion, the instructor sums up Complaint Handling by using four slides showing:

1. Sources of Complaint
2. Receiving a complaint, information logged
3. Information sought on interviewing complainant
4. Four guidelines for the FEO

The instructor should prepare himself thoroughly by reviewing the Student Manual, Chapter 13, on Complaint Handling as well as Chapter 14, Odor Detection and Evaluation. It would be most helpful if the instructor has actual Air Pollution Control Agency experience in handling complaints.

SELECTED REFERENCES.

Student Manual Chapters 13 and 14.
Also "Answer Key"

AIR POLLUTION TRAINING INSTITUTE

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 1

NOTES

Course: 444
Lecture Title: TIME SCHEDULE
LESSON 13
COMPLAINT HANDLING

ODOR COMPLAINT CASE STUDY

		Time Of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	CASE SETTING	3	5
III	STUDENT INTERROGATION AND DISCUSSION OF EXERCISE POINTS.	45	50
IV.	QUESTIONS AND OPEN DISCUSSION OF STUDENT'S PROBLEMS	15	65
V.	SUMMARY	7	72
VI.	CLOSING	3	75

CONTENT OUTLINE

Course: 444 LESSON 13
Lecture Title: COMPLAINT HANDLING

Page 1 of 1

NOTES

ODOR COMPLAINT CASE STUDY

I. INTRODUCTION

State goals and method.

Note: When case is given out at the end of previous day, give general instructions to students on format of this period.

II. CASE SETTING

Brief summary of the case.

SWB
Lesson 13.

III. STUDENT INTERROGATION AND DISCUSSION

Answer Key
Following this
page.

IV. QUESTIONS AND OPEN DISCUSSION OF STUDENT'S PROBLEMS

Call for any questions students have on Complaint Handling.

Encourage students to give complaint case histories of their own which illustrate proper complaint handling procedures.

V. SUMMARY

Use slides.

Slides
1 through 4.

VI. CLOSING

Announce availability of Answer Key, and actual case disposition for pick up by those so desiring a copy.

LESSON 13

ANSWER KEY

ODOROUS GASEOUS EMISSIONS COMPLAINT HANDLING

Q. Assuming that Harry neither did nor saw anything more than that stated in the case history, prepare a critique of his investigative technique. Indicate all errors and deficiencies in his technique.

CRITIQUE OF THE INVESTIGATION

As stated earlier, the field enforcement officer had little, if any, practical experience in the investigation of air pollution complaints. One of his principal mistakes was his assumption that, because he could not detect any malodors, a problem did not exist. The following procedures would have been good technique:

1. Harry should have noted the direction from the complainant's home to the plant, any significant topographical features (or lack of them), and the prevailing wind direction.

2. The inspector failed to ask Mrs. Rust to characterize the odor and to indicate when it was most prevalent. He also neglected to ask whether or not she had noticed the wind direction during the episode and failed to record the names and addresses of the other complainants indicated by Mrs. Rust. Several of these people should have been contacted and questioned concerning the characteristics and prevalence of the odor episodes and the wind direction during the episodes.

3. Upon arrival at the plant, Harry should have attempted to get downwind of the plant to determine whether or not there was an odor emanating from the plant's operations.

4. He properly identified himself and was correct in accepting an interview with the plant engineer when the plant manager was not available.

5. The interview with the plant engineer was carried out poorly. It should have been specifically directed toward obtaining information about the process operations as they affected the air pollution potential: the operating and maintenance procedures, the operation of the air pollution control equipment, and the review of records related to the preceding. Some specific items which should have been obtained are:

    a. Types and quantities of paints used, including types and percentages of solvents used in the paints.

b. Oven temperatures.

c. Temperatures and volumes of the various effluent streams.

d. Operation and maintenance schedules, including times of day when paint baking occurs and any unusual operating conditions such as formulations that require higher baking temperatures or contain unusually high percentages of solvents or particularly odorous solvents.

e. Control system data including information on temperatures of inlet and outlet gases, volumetric throughput, and catalyst maintenance schedules.

6. During the interview, the plant's operating permit should have been reviewed and inquiries made to determine that the plant's equipment and operation was actually the same as that covered in the permit.

7. After the interview, the plant inspection should have been utilized to verify wherever possible the information given in the interview. The inspection should have covered the following:

a. Inspection of the specific equipment used for each phase of the production operation.

b. Inspection hooding, ducts, fans, drive belts, temperature recorders, and general level of maintenance.

c. Inspection of air pollution control equipment. Review of any charts, recordings or maintenance schedules utilized in conjunction with the control equipment.

d. An attempt should have been made to get onto the roof in the vicinity of the stacks to ascertain whether any odor could be detected in the exhaust gases.

8. After the plant inspection, Harry should have made a greater effort to determine if the metal-plating plant mentioned by Mr. Erb could actually have been the malodor source. Merely driving by the plant is hardly a proper investigative technique.. An investigation similar to that done at the Alcoat Company should have been performed at the metal-coating company.

9. Prior to completing his report and recommendations, Harry should have discussed the case with a more experienced investigator. It is likely that the shortcomings of his investigation would have been pointed out to him and a proper investigation rescheduled.

Assuming that the investigation indicated that the Alcoat Company was indeed the source of the odors, explain how you would go about establishing a bona fide air pollution case. Remember that there are no specific odor control regulations and that the burden of proof in establishing air pollution as defined in the agency's ordinance rests with the agency. An odor problem of this type is effectively a public nuisance and the manner of establishing the existence of the problem would be similar to that used to establish the existence of a public nuisance.

COLLECTING DATA FOR ESTABLISHING THE CASE

Once Harry's superiors had determined that the complaints were increasing rapidly in number and that they were coming from various locations throughout Orangeland, they immediately consulted with him and advised him of the procedures to be followed:

1. Obtain a complete description of the area surrounding the Alcoat plant including the plant location, the location of the residents, distances and direction from plant to complainants, significant topographical features, and location and nature of any other sources in the immediate area which could be causing a problem.

2. Contact all of the complainants and determine, if possible, the character of the malodors: when they are most prevalent, their duration and wind direction at time of occurrence, and any other pertinent data.

3. Request the citizens' assistance by establishing a citizens' odor panel. (Five or six of the residents are to be asked to keep a log of malodor episodes and record, to the best of their ability, the character of the odor, the strength of the odor, the times of occurrence (noting the duration), and the wind direction during the episode.)

4. Revisit the Orangeland area daily, at the hour of peak production, if time is available, or on selected days with unfavorable meteorology, until the existence of the malodors is conclusively established. Determine if Alcoa is the source by proper odor survey procedures.

5. Revisit the Alcoat plant for the purpose of conducting a proper inspection and request the plant to routinely submit operating schedules to the agency.

6. Obtain wind speed and direction data from a nearby airport weather station.

7. Ask the agency technical staff to review the plant data to evaluate the odor potential of the various solvents used by the Alcoat Company, and request the engineering staff to investigate and evaluate the performance of the catalytic combustion units utilized by the company.

ANALYSIS OF DATA AND ESTABLISHMENT OF CASE

As during the initial investigation, at the follow-up investigations Alcoat repeatedly claimed that it had no odorous emission problems and that it was conforming to all applicable air pollution control regulations. They again implied that if there was a problem in the area it was caused either by some other company or by malfunctioning of local sewage disposal systems.

In rebuttal to the company's position, the agency determined that:

1. The Alcoat Company is located less than one-half mile due west of Orangeland. Any winds blowing from the northwest through the southwest quadrant would blow across the plant and impinge upon some area of Orangeland. Meteorological data accumulated over the past three years indicates that during sixty-one (61) percent of the time, the wind blows towards the development from the northwest through the southwest quadrant. There are no significant topographical features that interfere with this wind flow.

2. All complainants were contacted. They characterized the odor as a solvent-type odor or as an eye and nose irritant. One complainant characterized the odor as that of rotten cabbage. It was subsequently determined that this individual's neighbor had a seeping septic tank system which was causing a localized odor problem.

   In all, thirty families were contacted. Twenty-five of the families indicated that the solvent odors were severe enough to require corrective action. Fifteen of the complainants indicated that they would be willing to testify in court.

3. Eight of the complainants were selected to monitor and log odor episodes in their area. These logs indicated that the odors are characteristic of solvent odors, are very strong when detected, and are usually present when the wind is blowing from the Alcoat plant toward their homes. The location of the metal-plating plant is such that it would not have been the source of the odors during the monitored episodes.

4. Harry and another inspector were assigned to visit the Orangeland area at random times. Over a period of two weeks during which time they conducted seventeen investigations, they confirmed the existence of solvent odors and other irritation gases in the Orangeland area twelve times. In nine out of the twelve verified episodes, the inspectors were able to report that the odors became stronger as they approached the Alcoat plant and that they were not present upwind of the plant. The dates and times of the observations were carefully recorded.

5. A more thorough investigation was conducted at the Alcoat plant. It was determined that the plant operates twenty-four hours a day and consumes approximately one-hundred gallons of paint per hour per production line. The paint composition normally is about 40% solvents (by volume). These solvents include, but are not limited to, amyl alcohol, methyl alcohol, methyl ethyl ketone, xylol and naptha. Phenolic resins are widely used in the paint formulations. The ovens operate at approximately 450°F and the volume of effluent is approximately 10,000 scfm per oven.

A trained observer, who visited the plant site, indicated that the odors present were characteristic of solvent odors and partially oxidized and polymerized organic solvents and resins. A review of the catalytic combustion units showed that there was little, if any, temperature differential across the catalyst. Residual odors were noted near the exhaust of the quenching operation.

6. A literature search on the solvents used revealed that the presence of methyl alcohol, amyl alcohol and methyl ethyl ketone in the air may cause irritation of the membranes of the eye and respiratory organs. The phenolic resins are normally stable at temperatures below 400°F. When heated above 400°F in compounds, the resins will release formaldehyde.

DISPOSITION OF CASE

Upon completion of the investigation, Alcoat was advised of the agency's findings and ordered to take corrective action. The company appealed the order and the case was heard before a hearing examiner. After listening to the testimony of ten complainants, and after hearing the comprehensive case that the agency had prepared (based on the previous information), the hearing examiner found for the agency. In his adjudication, he ordered the company to comply with the agency's directive.

The company claimed that they were not causing air pollution: that there were other sources of odor in the area, and that, in any event the ordinance was unconstitutional as it failed to set forth adequate standards for the determination of the existence of air pollution. In addition, they felt that the definition of air pollution was vague and uncertain and not suscep-

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tible to acceptable standards of proof. They were not satisfied with the hearing examiner's adjudication and appealed to the county court.

The county court carefully reviewed the record of the case and the testimony presented before the hearing examiner. The court found that "There is no doubt that the evidence confirming the existence of an air pollution problem is substantial. The testimony amply supports the hearing examiner's findings." As a result of its determinations, the court dismissed the appeal and ordered that the adjudication of the hearing examiner be sustained.

The agency won this odor case primarily by producing a preponderant weight of evidence to verify the existence of an air pollution problem. Its careful and thorough investigation was the keystone upon which the entire case was based. Since most odor problems are very subjective in nature, it is important that the investigator accumulate a preponderence of evidence to tip the scales in his direction. It is equally important that the receptors or the complainants be willing to support the agency's efforts and that they be used to the best advantage.

7/79 444 - LESSON 13

- EXPLAIN THE LAW.
- DETERMINE IF COMPLAINANT WILL TESTIFY
- HAVE PERSON KEEP LOG
- NOT PROMISE COURT ACTION

LESSON 14

ODOR DETECTION AND EVALUATION

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 14
ODOR DETECTION AND EVALUATION

COURSE: 444
LESSON TIME: 60 min.
PREPARED BY: C. W. Gruber
DATE: 1/19/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. To teach the principles of odor detection and evaluation.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. Define odor and odorant.
2. Identify the characteristics of odor perception.
3. State the four odor parameters.
4. Name which parameter is used in odor regulations.
5. Explain why odor measurement by instruments is difficult.
6. Define "odor unit".
7. Name three instruments which aid odor threshold measurement.
8. Identify the characteristics of odor transport from source to receptor.
9. Explain a means of tracing an odor source.

SELECTED READING. References 19, 22 and 23.

STUDENT PREREQUISITE SKILLS. Attendance at previous lectures.

LEVEL OF INSTRUCTION. Narrative except for an entering level of the technical aspects of odor measurement.

LESSON PLAN (CONT'D)

LESSON 14

INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	No special background is required; some experience in handling complaints prior to entering the course is helpful.
SUPPORT MATERIALS EQUIPMENT LISTS	35 mm Slide Projector and Screen 35 mm Slides Blackboard
SPECIAL INSTRUCTIONS.	The lecturer should have some experience in handling odor complaints. The lecturer can well be the same person who gives Complaint Handling.
SELECTED REFERENCES.	1. Phelps, A. H., in Air Pollution, Stern, Ed. 3 Vol. III, Chapter 8, Academic Press, NY, 1976. 2. Development Odor Control Regulations, JAPCA, Jan. 1978. 3. Leonardis et al, Odor Threshold of 53 Odorant Chemicals, JAPCA, 19 No. 2, Feb. 1969. 4. Leonardis - A Critical Review of Odor Control Regulations, JAPCA, 24, p. 456 - 468, 1974.

CONTENT OUTLINE

Course: 444
TIME SCHEDULE
LESSON 14
Lecture Title: ODOR DETECTION AND EVALUATION

Page 1 of 1

NOTES

		Time Of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	CHARACTERISTICS OF ODOR PERCEPTION	2	4
III.	ODOR PARAMETERS	5	9
IV.	ODOR IDENTIFICATION	7	16
V.	ODOR MEASUREMENT	10	26
VI.	INSTRUMENTATION	14	40
VII.	FINDING THE ODOR SOURCE	10	50
VIII.	INVESTIGATION AND ENFORCEMENT	5	55
IX.	SUMMARY	5	60

CONTENT OUTLINE

Course: 444 LESSON 14
Lecture Title: ODOR DETECTION AND EVALUATION

Page 1 of 7

NOTES

I. INTRODUCTION

Odor causes strong (nearly violent on occasion) public complaint.

Odor recognition by citizen is instant. (Does not need instruments to tell it is bad.)

II. CHARACTERISTICS OF ODOR PERCEPTION

A. FEO is concerned about odor so he can,

Slide 14-1

Sums up
SM p. 12-2 &
12-3

- Identify them as a cause of public nuisance.
- Identify the odorant.
- Trace the source.
- Collect evidence.
- Determine if a regulation has been violated.
- Assess the effectiveness of control.

CONTENT OUTLINE (CONT'D)

LESSON 14

In estimating whether an odor problem exists, the following are helpful:

Slide:

SM p. 12-3

* The olfactory sense becomes fatigued after continuous perception of an odor.
* An odor is usually detected whenever there has been a significant change in odor quality or intensity.
* Odors do not, in themselves, cause physical disease.
* A person's ability to perceive odors varies from day to day.
* Compounds of different constitution may yield similar odors, whereas compounds of very similar constitution may yield different odors.
* An unfamiliar odor is more likely to cause complaints than a familiar one.
* The perception level of odors decreases with increasing humidity. However, high humidity often coincides with poor ventilation which retards dispersion and increases odor perception. Example: increase of odor complaints at night.
* Odor quality may change upon dilution.
* Some persons can detect certain odor qualities but not others.

B. Definitions

Slide: 14-2

SM p. 12-3

Odor is "a sensation of smell perceived as a result of olfactory stimulus."

Odorant is "the substance which causes an odor."

CONTENT OUTLINE (CONT'D)

LESSON 14

III. ODOR PARAMETERS

Slide:14-3
P. 12-4

- Quality
- Intensity
- Acceptability
- Pervasiveness

A. Quality

Henning's Odor Classification

Slide: 14-4
P. 12-5

Spicy - as in cloves, cinnamon.

Flowery - as in jasmine.

Fruity - as in apples, vinegar.

Resinous - as in turpentine.

Foul - as in hydrogen sulfide, or products of decay.

Burnt - as in scorched substances.

B. Intensity

Giving a numerical or verbal indication of strength as

Slide : 14-5
SM p. 12-5

Rating	Description
0	No detectable odor.
1	Odor barely detectable.
2	Odor distinct and definite.
3	Odor strong enough to cause attempts at avoidance.
4	Odor overpowering, intolerable for any appreciable time.

C. Acceptability

An odor may be acceptable or unacceptable depending on its intensity and quality.

Odor Acceptability

Hedonic basis

D. Pervasiveness

Slide: 14-6
Graphic
SM p. 12-6
Slide 14-7

The tendency to resist being dissipated by dilution.

A highly pervasive odor hangs around for a long time.

CONTENT OUTLINE (CONT'D)

LESSON 14

IV. ODOR IDENTIFICATION

For FED best is "smells like".

Slide 14-8

SM p. 12-7

Table 14a-1 Interpretation of Complaints

Complaint	Identification
* Rotten eggs	H_2S
* Rotten cabbage	Mercaptan
* Natural gas	Mercaptan
* Dead fish	Di methylamine
* Outhouse	Amines
* Rotten odor	Rendering
* Scorched popcorn	Grain drying by direct flame
* Coffee	Coffee Roasting
* Bleach	Chlorine
* Ammonia	Ammonia
* Phenol	Phenol

V . ODOR MEASUREMENT

Most important to FED.

A. Thresholds cannot be anticipated from chemical structure.

"Aside from sulfides, it is not possible to anticipate the odor threshold of a material because of its chemical structure."

Ref. 4

Slide 14-9

SM p 12-8

Table 14a-2 Odorant Threshold Concentrations

Chemical	Odor Threshold	Description
Acetone	100.0	Chemical
Acrolien	0.21	Burnt, Pungent
Trimethylamine	0.00021	Fishy
Ammonia	46.8	Barn-like
Benzene	4.68	Solvent
Hydrogen Sulfide	0.00047	Rotten egg
Dimethylamine	0.5	Fishy

So all roads point to the human nose as the "measuring instrument", aided by some form of dilution mechanism.

CONTENT OUTLINE (CONT'D)

LESSON 14

B. Units of Intensity Measurement *

Slide 14-10
SM p. 12-9

Dilution Factor

Odor Unit

1. Dilution Factor

The ratio of the diluted volume to the original sample.

Slide 14-11
SM p. 12-9

2. Odor Unit - better for engineering.

"Odor Unit" is a defined term.

Slide 14-12
SM p. 12-9

The amount of odor necessary to contaminate one cubic foot of odor free air to the threshold, or barely perceptible, level. Note: A sample containing less than one odor unit per cubic foot has no perceptible odor for the average observer.

3. Method of determination -
Withdraw an odorous sample, dilute with odor free air till the mix is at threshold, determine by a single trained observer or a panel.

Odor strength is calculated by:

$$\frac{\text{Sample Volume + Odor free Volume}}{\text{Sample Volume}} = \text{Odor Strength in odor units per cu. ft. by definition.}$$

Slide 14-13
(Not in Text)
Shows a 1 cu. ft. sample being diluted
One cubic foot sample is not practical

Example of Odor Unit

odor-ous	+	Odor free	=	Mix
5 ml	+	95 ml	=	100 ml
Sample	+	Dilution Air	=	Mix at threshold

$$\frac{5\,\cancel{m}l + 95\,\cancel{m}l}{5\,\cancel{m}l} = \frac{100}{5} \text{ or } 20$$

Odor strength by definition is 20 odor units/cu. ft.

Slide 14-14
SM p. 12-9

* Note to Instructor: Be careful not to consume too much time with specifics of measurement. Try to get the concept of how odor concentration, by using "dilution factor" or "odor unit", is done. It will be easier if the concept of a single "trained observer" is used. To explain the panel method will consume too much time. If any student wishes to pursue the panel method, refer him/her to Reference 5.1 p. 934 and Reference 19, both of which are very good. Remember, there is a test question concerning a sample containing less than one odor unit per cubic ft. See Question 10, Test 3.

CONTENT OUTLINE (CONT'D)

LESSON 14

VII. FINDING THE SOURCE OF ODOR

A. Characteristics of Transport from Source to Receptor — SM p. 12-13

- Odor flows down wind from source to receptor.
- Transport from a vent or chimney is in a plume. (Similar to a visible particulate plume.)
- Meteorology is favorable for transport with little dilution in the night-time. Prevalence of nocturnal inversions and low wind speeds.
- In favorable meteorology, odors travel long distances.
- Odors are dissipated by dilution, therefore may change from source to receptor.
- Odors per se leave no residual effects.

B. Tracing the Odor Source (Insitu wind vector measurement)

Release a helium filled balloon from the center of the odor plume and track its flight. For night-time observations, use bright yellow balloons and a six cell flashlight.

1. Inflate balloon with helium, about 6 inches dia. — Slides 14-22 through 14-24
2. Release balloon.
3. Trace path by sighting with a hand held compass. — SM p. 12-15
4. Record wind direction.

C. Locating source by triangulation. — Slides 14-25 through 14-26 SM p. 12-15

Make multiple observations by balloon release and triangulate on a map.

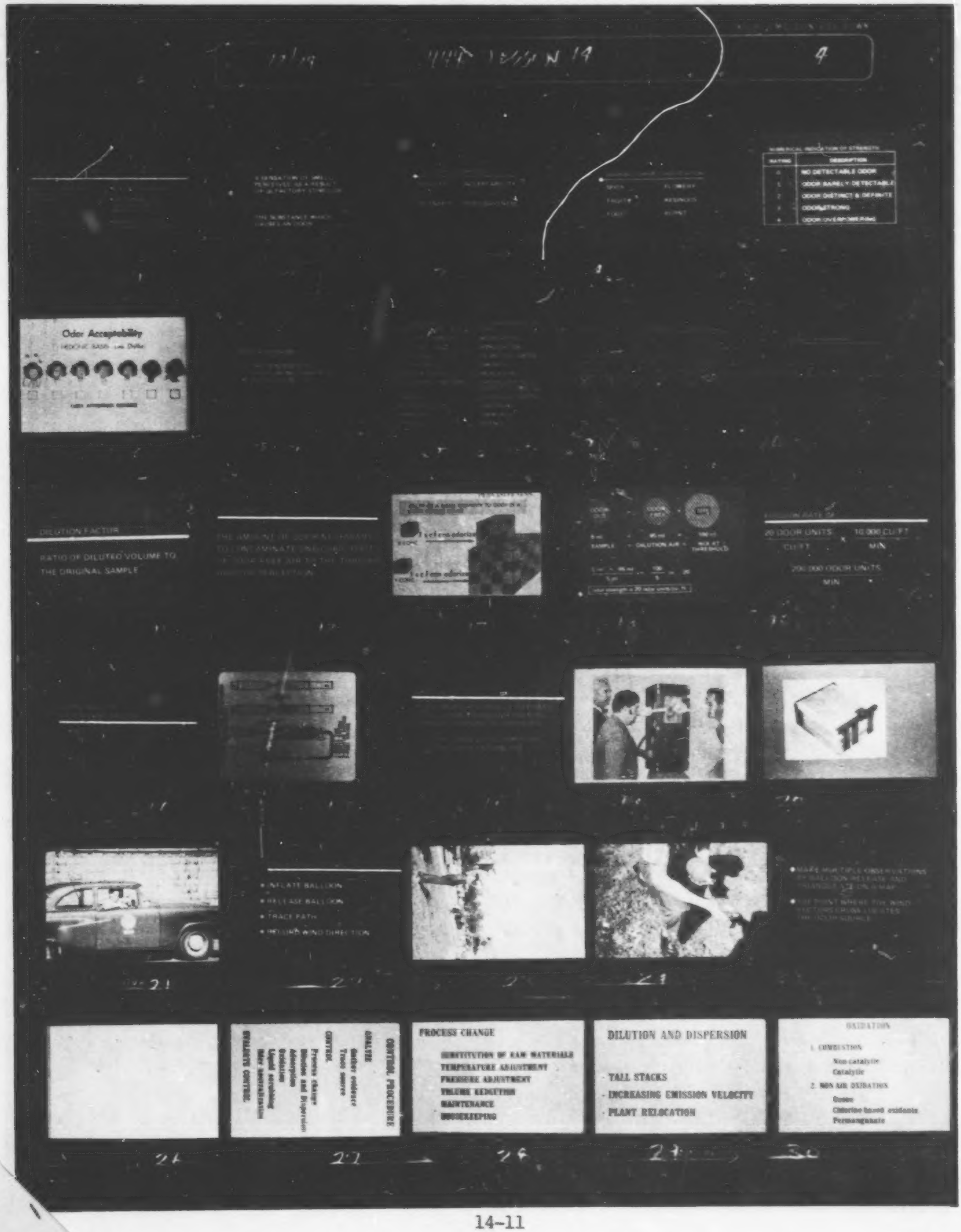
The point where the wind vectors cross locates the odor source.

VIII. CONTROL PROCEDURE

(Generally this must be cut as there is insufficient time.) — Slides 14-27 through 14-32

IX. SUMMARY

Instructor prepares his own summary.



12/19 LESSON 14 4

A SENSATION OF SMELL PERCEIVED AS A RESULT OF OLFACTORY STIMULUS

THE SUBSTANCE WHICH CAUSES AN ODOR

SPICY FLOWERY
FRUITY RESINOUS
FOUL BURNT

NUMERICAL INDICATION OF STRENGTH

RATING	DESCRIPTION
0	NO DETECTABLE ODOR
1	ODOR BARELY DETECTABLE
2	ODOR DISTINCT & DEFINITE
3	ODOR STRONG
4	ODOR OVERPOWERING

Odor Acceptability

HEDONIC BASIS

DILUTION FACTOR

RATIO OF DILUTED VOLUME TO THE ORIGINAL SAMPLE

5 ml SAMPLE + 95 ml DILUTION AIR = 100 ml MIX AT THRESHOLD

odor strength = 20 odor units/cu. ft.

EMISSION RATE OF

$\frac{20 \text{ ODOR UNITS}}{\text{CU FT}} \times \frac{10{,}000 \text{ CU FT}}{\text{MIN}} = \frac{200{,}000 \text{ ODOR UNITS}}{\text{MIN}}$

- INFLATE BALLOON
- RELEASE BALLOON
- TRACE PATH
- RECORD WIND DIRECTION

- MAKE MULTIPLE OBSERVATIONS BY BALLOON RELEASE AND TRIANGULATE ON A MAP
- THE POINT WHERE THE WIND VECTORS CROSS LOCATES THE ODOR SOURCE

21

CONTROL PROCEDURE

ANALYZE
Gather evidence
Trace source

CONTROL
Process change
Dilution and Dispersion
Adsorption
Oxidation
Liquid scrubbing
Odor neutralization

EVALUATE CONTROL

PROCESS CHANGE

SUBSTITUTION OF RAW MATERIALS
TEMPERATURE ADJUSTMENT
PRESSURE ADJUSTMENT
VOLUME REDUCTION
MAINTENANCE
HOUSEKEEPING

DILUTION AND DISPERSION

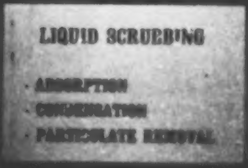
- TALL STACKS
- INCREASING EMISSION VELOCITY
- PLANT RELOCATION

OXIDATION

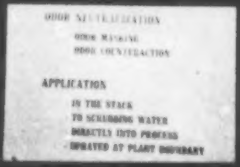
1. COMBUSTION
   Non-catalytic
   Catalytic
2. NON AIR OXIDATION
   Ozone
   Chlorine based oxidants
   Permanganate

30

11/19 444 LESSON 14 5


LIQUID SCRUBBING

- ABSORPTION
- CONDENSATION
- PARTICULATE REMOVAL


ODOR NEUTRALIZATION

ODOR MASKING
ODOR COUNTERACTION

APPLICATION

IN THE STACK
TO SCRUBBING WATER
DIRECTLY INTO PROCESS
SPRAYED AT PLANT BOUNDARY

LESSON 15

COMPLAINT INSPECTION OF AN ASPHALT CONCRETE BATCHING PLANT

FILM AND WORKBOOK

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 15

COMPLAINT INSPECTION OF AN ASPHALT PLANT FILM AND WORKBOOK

COURSE: 444

LESSON TIME: 90 min.

PREPARED BY: C. W. Gruber **DATE:** 1/19/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL.	To demonstrate a complaint inspection of an asphalt concrete batch plant. The student's proficiency is tested by completing inspection report forms to record conditions demonstrated in the film.
LESSON OBJECTIVES:	At the end of this lesson, the student should be able to:

1. Describe the process of manufacturing asphalt concrete in a batch plant.
2. Use existing agency data to prepare for an inspection.
3. Properly obtain entry to a facility for the purpose of conducting an inspection.
4. List inspection points for asphalt plants.
5. Interface effectively with plant management and personnel so as to elicit their help and cooperation.
6. List the information which must be obtained from a complainant.
7. Interview complainants so as to obtain necessary information and maintain good will.

SELECTED READING:

1. Inspection Manual for Enforcement of New Source Performance Standards.
   Asphalt Concrete Plants, Reference 27 in student manual.
2. See reference lesson 6

LESSON PLAN (CONT'D)

LESSON 15

STUDENT PREREQUISITE SKILLS.	Attendance at previous lessons of this course.
LEVEL OF INSTRUCTION.	This lesson with the film will demonstrate the principles covered in Lessons 14, 4 and 5.
INTENDED STUDENT PROFESSIONAL BACKGROUND.	Same as Lesson 1.
SUPPORT MATERIALS, EQUIPMENT LISTS.	16 mm sound movie projector and screen. Field Inspections: Asphalt Concrete Batching Plants
SPECIAL INSTRUCTIONS.	Instructors must preview this film before showing it in the classroom. See Lesson Content Outline.

AIR POLLUTION TRAINING INSTITUTE

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 1

NOTES

LESSON 15

TIME SCHEDULE

Course: 444

Lecture Title: COMPLAINT INSPECTION OF AN ASPHALT PLANT

FILM AND WORKBOOK

		Time Of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	LESSON CONTENT	3	5
III.	INSTRUCTIONS TO STUDENTS	10	15
IV.	IMMEDIATE PREPARATION FOR FILM	5	20
V.	SHOWING THE FILM	40	60
VI.	POST FILM DISCUSSION	30	90

AIR POLLUTION TRAINING INSTITUTE

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of

NOTES

Course: 444 LESSON 15
Lecture Title: COMPLAINT INSPECTION OF AN ASPHALT PLANT

FILM AND WORKBOOK

I. INTRODUCTION

State the Lesson Goal.

II. LESSON CONTENT

Centers on a film showing two FEO's responding to a complaint of dust deposited on the car of a nearby resident.

A format similar to Lesson 6 - Inspection of A Cement Plant will be followed.

1. Student views film as two inspectors respond to a complaint received over their car radio.
2. As the conduct of the complaint response is viewed on the film, each student makes notes on his own Data Gathering Form found in the Student Workbook.
3. After completion of 2, students discuss their own observation notes and compare their work with the observations of experienced inspectors furnished to the instructors.
4. After comparing notes, a general discussion of complaint response and inspection practice follows.

III. INSTRUCTION TO STUDENTS

A. Have students lay out forms on the table in the following order:

1. Data Gathering Form
2. Asphalt Plant Inspection Sequence

Leave in Workbook:

3. Permit Forms
4. Parametric Evaluation Form
5. Summary of Source Operation
6. Summary of Pitot Traverse Data
7. Summary of Particulate Sampling Data
8. Production Record for October, 1977.

B. Review with students:

1. Asphalt Plant Schematic
2. Sequence of Inspection

Do not go beyond this point as when the film is stopped, the students should look over the permits in a manner similar to the inspectors' review in the plant superintendent's office.

CONTENT OUTLINE (CONT'D)

LESSON 15

IV. IMMEDIATE PREPARATION FOR FILM

Have students ready the Data Gathering Forms and remind them to make entries as the FEO's on the film make their inspection.

One stop has been provided - just after the inspectors ask to see the permit file and the production records.

At this point, turn on lights - go over permit documents and production records, making appropriate notes.

The instructor must use his judgment in determining the length of this stop interval by observing when the students appear to be finished and the discussion of the permit documents and production record is completed.

The above is the only stop called for on the screen. There is no harm in stopping the film at other points if this seems warranted.

V. POST FILM DISCUSSION

After the students have had a chance to record their final observations, the session should be wrapped up with a discussion of the films and observations the students made. Data gathering forms, complete with observations as might be made by an experienced inspector, are provided at the end of this manual to assist the instructor in leading this discussion (See Answer Key). At the discretion of the instructor, these forms may be referred to only by the instructor, they may be used to create overhead transparencies for group viewing, or copies may be made and distributed to the group as hand outs. During this post-film discussion, interest should be centered on maximizing the simulation experience of the film inspections. The instructor should be careful to relate what is seen in the films to the problems and practices generally applicable to the FEO's field activity.

See Answer Key that follows.

Following the Answer Key is some suggested discussion points the instructor may use.

Following the questions is a completed "Inspection Data Form for Asphalt Concrete Plants" which the students do not have. This form may be used in any manner desired by the instructor.

GENERAL DISCUSSION

Complaint Handling Procedure

Q. Should FEO's have proceeded to the complainant residence before entering the plant?

A. Many procedures of complaint handling would call for this. By so doing, the FEO's would have more knowledge of the complainant conditions and would be in a better position to find the cause.

Q. What is possibility of fugitive dust being source of complaint vs. stack plume?

Points: Note wet grounds and wet stock piles.

Was plume caused by water vapor?

Recent heavy rains.

Inspectors Personal ualities

Q. Were they professional?

Q. Did they relate conditions at the plant to the text of regulations?

Q. Was their parting dialogue with the plant satisfactory?

General parting question

Q. How would you have handled this complaint?

LESSON 15

ANSWER KEY

DATA GATHERING FORM

Asphalt Plant*

ENTERING PLANT PREMISES

"Heavy emissions visible probably due to startup.
Considerable water vapor in plume."

(Q. What was your reaction? Discuss details of the plume appearance. Note wet grounds and wet aggregate.)

INTERVIEWING PLANT MANAGER

"Plant Manager cooperative. Indicated heavy production in recent days."

REVIEWING DATA PROVIDED

"Permit file complete and up to date. Production record indicates production at near capacity last several days. No unusual maintenance problems indicated."

- - - - - - - - - - - - - -

FILM STOPS HERE

Go through permit file and production record with class.

Q. How long would it have taken to do this in the superintendent's office. Is it really productive?

THE PLANT YARD

"No fugitive dust problem evident."

Note - water all over the grounds. Recent rains?

---

*Refer to the chart at the end of this form.

GENERAL PLANT SURVEY

"Some intermittent, light stack omission."

THE COLD FEED CONVEYOR/BUCKET ELEVATOR TRANSFER POINT

"No fugitive dust problem evident."

Again, note wet surfaces.

THE ROTARY DRYER

"Some puff-back around delivery end collar."

THE HOT ELEVATOR

"Some dust leaks from poorly sealed ductwork joints."

THE MIXING TOWER

"Some dust leaks from poorly sealed seams and joints."

THE UNDERSIDE OF THE BAGHOUSE

"One dust leak from screw conveyor."

THE BAGHOUSE EXTERIOR

"No leaks or emissions apparent. Well maintained except for one broken bag cleaning air line."

Q. How good was dialogue between superintendent and FEO's on departure?

THE INTERVIEW WITH THE COMPLAINANT

"Heavy dust fall-out evident on mailbox and automobile."

Q. Was this interview adequate?

LESSON 16

EMISSION CONTROL HARDWARE INSPECTION TECHNIQUE

LESSON PLAN

AIR POLLUTION
TRAINING INSTITUTE

TOPIC: LESSON 16
EMISSION CONTROL HARDWARE
INSPECTION TECHNIQUES

COURSE: 444
LESSON TIME 135 min.
PREPARED BY: C. W. Gruber
DATE: 1/19/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. To familiarize the student with inspection of the air pollution source system; the various classes of emission control hardware; the physical appearance of control hardware; operating parameters related to effective collection; and the inspection points of control devices.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. Name the six elements of the Source System.
2. Recognize various types of control hardware by the outward appearance.
3. Identify the inspection points of the Source System components.
4. Define one operating parameter which indicates the effectiveness of separation for each type of control equipment.
5. Recognize instrument indicators and physical signs which indicate when control equipment is not functioning effectively.

STUDENT PREREQUISITE SKILLS. Attendance at previous sessions of this course.

LEVEL OF INSTRUCTION. This lesson provides an entering level description of the Source System including various types of control hardware, their functional parameters, with emphasis on guides to inspection methods to reveal deterioration in performance from the newly installed equipment.

LESSON PLAN (CONT'D)

LESSON 16

INTENDED STUDENT PROFESSIONAL BACKGROUNDS.	An understanding of high school math would be helpful. An engineering degree would be also helpful but not required. Instructors must avoid use of involved mathematical models and language which cannot be understood by a high school graduate or a student with an "arts" degree.
SPECIAL MATERIALS, EQUIPMENT LISTS.	35 mm Slide Projector and Screen 35 mm Slides Blackboard
SPECIAL INSTRUCTIONS.	Instructor should have some familiarity with application and operation and maintenance of a wide range of control hardware. An engineer from a control agency or a staff air pollution control engineer from a complex industry should be a well qualified speaker who could furnish a wealth of case histories to illustrate his lecture. Students like and learn from case histories.
SELECTED REFERENCES.	Text.

AIR POLLUTION TRAINING INSTITUTE

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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NOTES

Course: 444 TIME SCHEDULE

Lecture Title: CONTROL HARDWARE

LESSON 16

		Time of Unit Min.	Ending Min.
I.	INTRODUCTION	5	5
II.	ELEMENTS OF THE SYSTEM	5	10
III.	NOTES ON SYSTEM COMPONENTS	10	20
IV.	CLASSIFICATION OF AIR POLLUTION CONTROL DEVICES	5	25
V.	GRAVITY SETTLING CHAMBERS AND DRY INERTIAL SEPARATORS	5	30
VI.	CYCLONES	15	45
VII.	FABRIC FILTERS	15	60
VIII.	ELECTROSTATIC PRECIPITATORS	15	75
IX.	WET COLLECTORS	15	90
X.	COMBUSTION	15	105
XI.	ABSORPTION	10	115
XII	ADSORPTION	5	120
XIII.	CONDENSATION	5	125
IX.	SUMMARY	10	135

AIR POLLUTION TRAINING INSTITUTE

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 15

NOTES

Course: 444
LESSON 16
Lecture Title: CONTROL HARDWARE

I. INTRODUCTION

This lesson tells you what to look for during an inspection to determine if the performance of the system is "up to permit" conditions and what the signs of deterioration (old age) are.

SM p. 13-1

The entire system is important, not just the control hardware.

II. ELEMENTS OF THE SOURCE SYSTEM

SM p. 13-2

- * System Entrance (point of contaminant generation)
- * Transport (duct work)
- * Air Mover (fan)
- * Instrumentation (controls and monitors)
- * Sub-systems (contaminant removal and feed materials)
- * Air Pollution Control Device

Slide 16-1
Fig. 13-1
SM p. 13-5

Slide 16-2
Fig. 13-2
SM p. 13-3

III. NOTES ON SYSTEM COMPONENTS

SM p. 13-4

A. System Entrance

The system begins at the hoods or process vessel.

1. In open entrance systems (hoods)
Volume flow and temperature of gas is usually steady (a beneficial condition).

   Look for spillage out of hoods or process vessels indicating insufficient volume flow.

2. Closed entrance system (most often combustion devices)
Volume flow and temperature fluctuate widely, seriously affecting certain collectors.

B. Transport (Duct System)

Look for: (a) leaks in the duct work caused by warping and cracking due to excessive temperature, deterioration by corrosion, or just poor workmanship, (b) possible blockage at elbows and dampers where large particles may be separated due to too low conveying velocity, (c) damper arms not working, (d) buckling - cracking - no provision for expansion.

CONTENT OUTLINE (CONT'D)

LESSON 16

C. Air Mover (usually a fan) SM p. 13-4

A proper fan is as important to the system functioning as the right collector. Too often, the fan as a source of trouble is neglected.

Fan may be positioned upstream or downstream of control device.

Important parameters are fan speed and fan horsepower. SM p. 13-5

For a given fan wheel.

Fan Speed (rpm) - volume varies directly as the rpm varies.

Fan horsepower varies with the cube of the volume, therefore, as cube of rpm. Motor amperes indicate fan horsepower.

Look for

1. RPM and/or motor amperes and compare with permit data. Too high, fan is overloaded; Too low, fan probably not moving enough air.

   Measuring fan rpm is difficult and impossible in many cases. Measuring motor amperes usually can be done. Some fan installations may have ampere meters.

2. Signs of fan imbalance - indicates loose blades or dirt on blades.

3. Other signs of deterioration

   * Excessive temperature coloring the metal
   * Cracked casing
   * Cracked duct connections
   * Water leaking from fan housing in a wet system

D. Instrumentation

Varies with control devices.

Will be discussed with control device.

CONTENT OUTLINE (CONT'D)

LESSON 16

E. Sub-systems

SM p. 13-6

1. Principally these would be

   * Dry particulate removal disposal
   * Dry Feed materials systems
   * Sludge from wet systems
   * Contaminated liquids from absorbers and scrubbers for removal of gases
   * Regeneration of adsorbing solids in adsorber.
   * Catalyst regeneration
   * Gas conditioning device, such as an evaporative cooler, cold air bleed-in, or heat exchanger

2. Inspection points

   The most important inspections points are

   (a) Systems for dry feed material and transfer of collected dust from hopper to disposition point.

      * Transfer points without enclosures or hoods and hoods not collecting
      * Leaks through bucket elevator conveyor housing
      * Open conveyors
      * Fugitive dust off storage piles
      * Mechanical transfer by front end loaders and bucket cranes
      * Roadway and driveway dust
      * Inadequate control on pneumatic conveyors
      * Failure of control devices on the conveyor system
      * Gravity transfer from hopper to open truck

We went through many of these inspection points in both cement and asphalt plant films.

CONTENT OUTLINE (CONT'D)

LESSON 16

(b) Wet Systems

Wet systems are usually no problem unless the contaminant is smelly. An odor problem may arise from settling ponds, holding tanks and trucks.

(c) Disposal of collected contaminant.

SM p. 13-6

Do not let the collected contaminant cause trouble. You are never free of potential trouble until the separated contaminant is

- * properly land filled
- * Sold as a usable product
- * Returned to the process
- * Converted into a non-contaminant as in combustion or absorption

(d) Gas Conditioner

SM p. 13-6

Look for: (a) evaporative coolers, where excessive water is being carried over into collector; (b) bleed-in systems with dampers inoperative; (c) heat exchangers with cracks or failures of metal components and (d) in all systems, failure of controls and inadequate instrumentation.

CONTENT OUTLINE (CONT'D)

LESSON 16

IV. CLASSIFICATION OF AIR POLLUTION CONTROL DEVICES

SM p. 13-7

All control devices function to: (a) separate the contaminants from the gas stream within the collector and then removes it without re-intrainment, either continuously or intermittently, by hopper batch, to the disposal system; (b) change the contaminant from offensive to inoffensive as in combustion or scrubbing or; (c) a combination of (a) and (b).

Control devices can be classified according to the service: i.e., for particulates only; particulates and/or gases and vapors; for gases only, and for vapors only.

A. Particulates (also known as dry collectors)

1. Gravity Settling Chambers
2. Inertial Separators
3. Centrifugal Separators (cyclones-multicyclones)
4. Fabric Filters (bag filter, baghouse)
5. Electrostatic Precipitator

B. Particulates and Gases and Vapors

1. Wet Collectors (scrubbers)

   Absorption towers or packed towers not included here - they cannot be used on particulates.
2. Combustion (afterburners, fume incinerators)

C. Gases

1. Absorption Towers
2. Adsorption

D. Vapors

1. Condensing

V. GRAVITY SETTLING CHAMBERS AND INERTIAL SEPARATORS

SM p. 13-7

Spend very little time here.

Gravity settling chambers are unimportant as a control device. Gravity separation is important in duct design as plugging of duct work will take place with inadequate conveying velocities.

Inertial separators, because of low separation efficiency on all but large particles (max. 80% on 15 micron size) are seldom used. An occasional installation of long standing may be seen. Because of time constraints, no further discussion will be given.

VI. CENTRIFUGAL SEPARATOR (Cyclones-Multicyclones)

SM p. 13-8

For solid or liquid particles.

Slide 16-3
Fig. 13-3

Separating mechanism. Centrifugal force causes particles to leave the gas vortex, and be thrown to the cyclone wall where it drops into the hopper.

SM p. 13-9

A. Physical Appearance

Slide 16-4
Fig. 13-4

1. Single

SM p. 13-9

- * High thruput - fat body, short in length, low efficiency.
- * High efficiency - small diameter body rather narrow inlet duct and long body. Higher efficiency than above unit.

Slide 16-5
Fig. 13-5

2. Multiple-Cyclone

SM p. 13-9

- * Many cyclones in a rectangular casing.

B. Parameters Related to Efficiency

Pressure drop (ΔP) across collector.
Very poor efficiency on sub-micron particles.

C. Inspection Points

SM p. 13-8

1. Check pressure drop across collector (ΔP). Too low, collection efficiency is reduced; too high excessive re-intrainment. ΔP varies greatly with volume flow.
2. Leakage through hopper bottom unloading valve, very important. Back flow destroys the vortex.
3. Holes due to corrosion or wear. Result, same as 2 above.
4. Hopper does not unload when valve is opened.
   - * When hopper fills, all collected particulates are discharged out the stack.
5. Plugging inlet duct. Indicated by reduced volume flow in duct system.
6. Condensation due to high humidity aggravates 4 and 5 above.
7. Interior parts deteriorated due to corrosion and wear. Indication is failure to collect giant particles. Look for fallout near outlet or citizen complaint.
   - * Single cyclone - the outlet duct extension corrodes away causing gas short circuiting.
   - * Multi-cyclone - individual tubes plug or wear causing functional failure of the tube.
8. Visibility of outlet gases.

CONTENT OUTLINE (CONT'D)

LESSON 16

D. Inspection Aids

- Pressure gage inlet and outlet or △P gage.
- Instrumental indicator for full hopper. One type available under trade name "Bindicator".
- "Poke-tubes" strategically located above hopper discharge. These are generally two inch diameter tubes, with removable cap, welded to the hopper.
- Inspection doors. Usually not used in single cyclones because of disturbing cyclone contours. but very important in multi-cyclone units to inspect interior cones and headers.
- Testing ports before and after cyclone. Usually required in new installations.
- Opacity meter on outlet duct.

VII. FABRIC FILTER (also known as bag filter or baghouse)

SM p. 13-10

For dry particles only.

Slide 16-6
Figure 13-6
SM p. 13-11
Small fabric filter

A. Physical Appearance

Most often a rectangular sheetmetal box, set on a hopper, often insulated, ranging in size from the small 100 cfm units about the size of a refrigerator packing box, to a very large unit handling 2,000,000 cfm which would fill one-half of a football field.

Slide 16-7
Fig. 13 [illegible]
SM p. 13-12
Large volume fabric filter

1. Separating Forces -

Building the cake
Impaction
Impingement
Electrostatic (natural)
Brownian movement (diffusion)

SM p. 13-10

Aftercake
Direct sieving.

The interior arrangement varies widely, affecting design and operation, but externally they are as described above. Occasionally, a designer creates a bag filter with a cylindrical exterior which may look very much like a cyclone.

CONTENT OUTLINE (CONT'D)

LESSON 16

B. Operating Characteristics

- Air to cloth ratios, influenced greatly by the cleaning mechanism and the fineness of the dust.
- The cleaning mechanism.

    Mechanical Shaking
    Air Shaking (Reverse Air)
    Bubble Cleaning
    Pulse Jet

- The type of cloth, dictated by character of dust and characteristics of gases to be cleaned, especially temperature.
- Effect of moisture.
- Temperature, methods of controlling.

Note: The baghouse is perhaps the only particulate collector whose efficiency is not related to particle size. A baghouse does well on sub-micron particles. In general, this is due to the filter cake being the cleaning surface and the finer the dust, the finer the filtration pores. A well designed baghouse should operate with a clear stack.

SM p. 13-10
Slide 16-8
Table 16-1
(Underlined values only)
Slide 16-9a, b, c
Fig. 16-8
SM p. 13-14

Slide13-10
Tablc 13-2
SM p. 13-15
(Include only the four cloths underlined)

C. Inspection Points

Table 5.13 Troubleshooting Checklist for Fabric Filters

1. High differential pressure.
2. Seepage - visible discharge.
    Causes:
    Bags improperly installed.
    Loose bag clamps.
    Torn bags - holes.
    Improper sealing at tube sheet.
3. Insufficient suction on exhaust hood or system.
4. Dampers do not operate or fit tightly to the duct.
5. Visibility of outlet gases.

SM p. 13-21

D. Inspection Aids

- Differential pressure gage, before and after baghouse, and for each compartment.
- Indicator lights to show cleaning cycles.
- Indicating ammeter on fan motor.
- Temperature, preferable recording, at inlet and outlet where temperature is a factor.
- Indicators to show damper positions (for larger installations.
- Testing ports.

CONTENT OUTLINE (CONT'D)

VIII. ELECTROSTATIC PRECIPITATORS

SM p. 13-17

for dry solid or liquid particles.

A. Physical Appearance

Slide 16-11
Fig. 13-10
SM p. 13-20

Much like the baghouse but the ESP is distinguished by the rapping mechanism and the transformer-rectifier sets usually mounted on top of the housing.

B. Operating Characteristics (Separating Mechanism)

Slide 16-12 a,16-1
Fig. 13-9
SM p. 13-16

1. Particles are charged by gas ions created by high voltage electrical field.

   In power plant ESP charge is usually negative.

2. Charged particles migrate to collecting plate of positive potential and grounded.

3. Charges leak off collected particles.

4. Particles grow by agglomeration on plates.

5. Plates are rapped periodically to cause agglomerated particles to drop into hopper, or are washed in an irrigated ESP.

6. Power supply to wires is

   30 to 100 KVA and
   20 to 100 MA

Slide 16-13
Figure 13-11
SM p. 13-19

7. High voltage causes sparking from wires to plates.

8. Peak performance when voltage is high enough to cause some sparking.

9. The sparking rate is sometimes used as an indication of maximum efficiency.

10. Two-stage ESP
    Operates much like a home electrostatic air cleaner, voltage about 10 K.

SM p. 13-17
Slide 16-14
Fig. 13-12
SM p. 13-20

CONTENT OUTLINE (CONT'D)

LESSON 16

C. Major Inspection Points

SM p. 13-21

- Increased visibility of stack emission.
- Rectifier output in kilovolts and miliamps.
- Sparking rate in sparks per minute.

  100 sparks per minute may be considered a reasonable value. Major variations should be checked against permit data or manufacturer's recommendation.
- Check maintenance logs.
- Check for process change such as: (a) raw materials, change in sulfur or ash content of coal; (b) chemical composition or; (c) rate of flow.
- General physical conditions to indicate quality of maintenance.

D. Inspection Aids

Primarily the instrumentation to carry out the inspection points in C above as

- Opacity meter on outlet
- Voltmeter and ammeter on each of the electrical subdivisions
- Spark rate indicator
- Rapping cycle indicators
- Sampling ports
- Maintenance logs

IX. WET COLLECTORS (SCRUBBERS)

SM p. 13-21

For wet or dry particles. The almost endless variety of wet collectors makes it difficult to include all types of scrubbers in this course. However, several of the more common types are shown.

Separating mechanism is impaction on liquid particle or wetted target.

CONTENT OUTLINE (CONT'D)

LESSON 16

A. Physical Appearance

SM p. 13-29
Slide 16-15
Figure 13-13
SM p. 13-23

See Figures 16-13 through 16-15.

B. Operating Characteristics

Slide 16-16
Figure 13-14
SM p. 13-24

The parameters of great importance are:

(a) The pressure drop across the collector; (b) the L/G ratio (gallons of scrubbering water/acfm of gas flow) and; (c) the percent of liquid recirculation; (d) efficiency of mist eliminator.

C. Inspection Points

Slide 16-17
Figure 13-15
SM p. 13-25

Inspection points would be related to B above.

- Pressure drop across venturi throat.
- Gas volume in acfm.
- Liquid flow rate in gpm.
- Gas temperature inlet and outlet.
- Recirculation of scrubbing liquid in percent.
- Opacity of stack discharge.

D. Inspection Aids

- Instruments to indicate the above parameters.
- Visibility meter taking necessary precaution that condensed water vapor does not add to opacity at the meter location.

X. COMBUSTION

SM p. 13-22

For gases and vapors.

Separating mechanism. The contaminant is chemically changed by oxidation to non-pollutant compound.

CONTENT OUTLINE (CONT'D)

LESSON 16

A. Physical Appearance

SM p. 13-21

There are two types of combustion devices.

Slide 16-18
Figure 13-16
SM p. 13-26

1. Direct or thermal units are furnace-like in appearance with either gas or oil burning apparatus plainly visible.

Slide 16-19
Figure 13-17
SM p. 13-26

2. Catalytic units have the appearance of a duct heater, generally made of sheet metal, rather highly instrumented.

B. Parameters Relating to Efficiency

In both thermal and catalytic units, the parameter indicating efficiency is the outlet temperature which is dictated by the characteristics of the contaminant to be oxidized.

In thermal units, the minimum outlet temperature is considered to be 1200° F. with certain substances requiring considerably higher temperatures.

Catalytic units are generally designed for a 500° F. rise across the catalyst bed.

Permits should always state the temperature parameters for reference during inspections.

C. Inspection Points

SM p. 13-22

Principally, the outlet temperature for thermal units or temperature rise for catalytic units.

Outlet visibility or odor emission should be checked.

D. Inspection Aids

- Recording temperature instruments
- Opacity meter where visibility results from inadequate thermal oxidation.

Note: Both units are usually highly instrumented with controls for safety and fuel economy. These can be of interest to the specialized FEO.

CONTENT OUTLINE (CONT'D)

LESSON 16

XI. ABSORPTION

SM p. 13-27

For gases and vapors (particulates plug)

Separating mechanism is transfer of contaminants from carrier gas stream by dissolving them in an absorbing solution.

A. Physical Appearance

Slide 16-20
Figure 13-18
SM p. 13-28

A cylindrical vessel, generally with contaminated gas stream entering at bottom, leaving at top (countercurrent flow).

B. Operating Characteristics

Absorbers can be

- Plate towers
- Spray towers
- Packed towers

C. Packed towers are most common.

Slide 16-21
Figure 13-19
SM p. 13-28

Describe the packing.

D. Inspection Points

Inspection is rather difficult.
Major importance is design.

- L/G Ratio
  Liquid Flow/Gas Flow.
- Temperature of Absorbent
  (in some cases)
- If absorber is for odor control, sniff test near discharge point.

E. Inspection Aids

Instrumentation for

Liquid flow, Gas flow and Absorbent temperature (when important.

CONTENT OUTLINE (CONT'D)

LESSON 16

XII. ADSORPTION

SM p. 13-27

For gases only.

Separating Mechanism. Mass transfer of contaminant from gas stream to surface of solid absorbent.

A. Physical Appearance

Usually a vessel for containing the adsorbing solid arranged: (a) in a cannister, (b) in a thin bed such as a filter, or (c) in a thick bed placed in a closed cylindrical vessel.

Thick bed units are often installed in parallel with piping and controls for automatic cyclic operation from adsorption to desorption modes.

Slide 13-22
Figure 13-20
SM p. 13-30

B. Inspection of Adsorbers

An adsorber is a complex process and no definitive parameters, which can be instrumented, are available for surveillance. Since adsorbers are often used in odor control, inspection might be the observation of odor carryover from the stack. In many cases, economic recovery of solvents spurs the operator to maintaining efficiency. The only real measure of performance is an emission test performed by a trained stack test team.

Dirty gases also containing particulates (especially greasy particles) plug adsorber.

XIII. CONDENSING

SM p. 13-29

For vapor recovery.

A. Physical Appearance

Slide 16-23a
& 16-23b

Condensers are

- Shell and tube, a cylindrical vessel, or
- Contact, a direct spray where discharge is into a hot well.

CONTENT OUTLINE (CONT'D)

LESSON 16

B. Inspection of Condensers

Condensers are used to abate odors or recover solvents from high temperature exhausts from drying processes.

An important parameter is the temperature and flow rate of the condensing liquid.

Instrumentation would permit monitoring of such temperature and flow rates.

As in adsorption, a good surveillance technique is to monitor the odor from the stack. The only measure of compliance would be a source test.

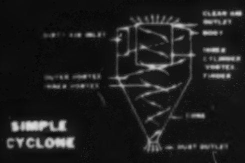
XIV. SUMMARY

The instructor constructs his own summary.

2/79 444 LESSON 16 6

1

EXHAUST SYSTEM



SIMPLE CYCLONE

CLEAN AIR OUTLET
BODY
INNER CYLINDER VORTEX FINDER
OUTER VORTEX
INNER VORTEX
CONE
DUST OUTLET

TYPICAL SINGLE CYCLONE COLLECTORS

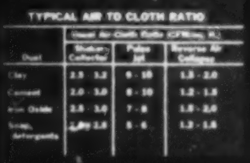
High Efficiency
High Throughput

4

MULTIPLE-CYCLONE

GAS INLET
GAS OUTLET

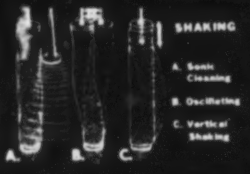
5



TYPICAL AIR TO CLOTH RATIO

Dust	Usual Air-Cloth Ratio (CFM/sq. ft.)		
	Shaker Collector	Pulse Jet	Reverse Air Collapse
Clay	2.5 - 3.2	9 - 10	1.5 - 2.0
Cement	2.0 - 3.0	8 - 10	1.2 - 1.5
Iron Oxide	2.5 - 3.0	7 - 8	1.5 - 2.0
Soap, detergents	[illegible] 2.5	5 - 6	1.2 - 1.5

8



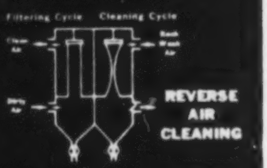
SHAKING

A. Sonic Cleaning

B. Oscillating

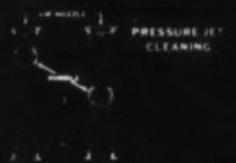
C. Vertical Shaking

9a



REVERSE AIR CLEANING

Filtering Cycle
Cleaning Cycle
Clean Air
Back Wash Air
Dirty Air

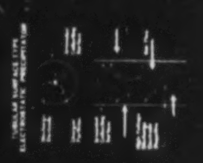


PRESSURE JET CLEANING

CHARACTERISTICS OF FILTER FABRICS

ELECTROSTATIC PRECIPITATOR

FLAT SURFACE TYPE ELECTROSTATIC PRECIPITATOR



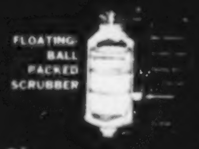
TUBULAR SURFACE TYPE ELECTROSTATIC PRECIPITATOR

IRRIGATED TUBULAR BLAST FURNACE PRECIPITATOR

13

COMPONENTS OF STANDARD 2-STAGE PRECIPITATOR

CENTRIFUGAL SPRAY SCRUBBER



FLOATING BALL PACKED SCRUBBER

16

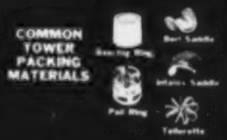
VENTURI SCRUBBER

DIRECT-FIRED AFTERBURNER WITH TANGENTIAL ENTRIES FOR BOTH THE FUEL AND CONTAMINATED GASES

CATALYTIC AFTERBURNER UTILIZING DIRECT HEAT RECOVERY

PACKED TOWER

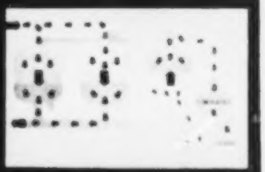
20

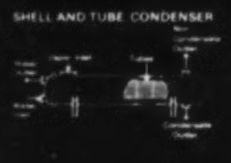


COMMON TOWER PACKING MATERIALS

Raschig Ring
Berl Saddle
Intalox Saddle
Pall Ring
Tellerette

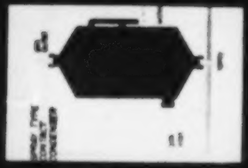
21





SHELL AND TUBE CONDENSER

Vapor Inlet
Tubes
Non Condensable Outlet
Condensate Outlet



SPRAY TYPE CONTACT CONDENSER

LESSON 17

INSPECTION OF COMBUSTION SOURCES

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 17
INSPECTION OF COMBUSTION SOURCES
WORKBOOK AND FILM

COURSE: 444
LESSON TIME: 90 min.
PREPARED BY: C. W. Gruber
DATE: 1/19/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL. To teach the elements necessary for complete combustion as they relate to an inspection to be carried out by an experienced FEO.

LESSON OBJECTIVES. At the end of this lesson, the student should be able to:

1. Identify various important components of fuel burning systems, especially coal or oil.
2. Enumerate the inspection points and observations which should be made.
3. Explain the elements necessary for complete combustion.
4. Define air-fuel ratio.
5. Identify the instrumentation which relates to combustion control.
6. Identify the instruments which relate to monitoring of the combustion process and emissions therefrom.

STUDENT PREREQUISITE SKILLS. Attendance at previous lessons of this course.

LEVEL OF INSTRUCTION. Introductory lecture with visual aids specifically directed to coal and oil burning boilers in utility and large industrial plants, to be followed by a film depicting the inspection of three plants: a pulverized coal fired utility boiler plant (also describing a cyclone furnace); an industrial size boiler fired by a spreader stroker; and a large plant burning residual or distillate oils. Periodically during the film, the showing is stopped and the students make entries on forms responding to appropriate questions. After the film is completed, the student answers are compared with the instructor's answers and appropriate discussion is generated.

LESSON PLAN (CONT'D)

LESSON 17

INTENDED STUDENT PROFESSIONAL BACKGROUNDS.

An understanding of high school math would be helpful. An engineering degree would be also helpful but not required. Instructors must avoid use of involved mathematical models and language which cannot be understood by a high school graduate or a student with an "arts" degree.

SPECIAL MATERIALS, EQUIPMENT LISTS.

35 mm Slide Projector and Screen
16 mm Sound Movie Projector, self threading
Blackboard
Slides, 35 mm
Film - Inspection of Combustion Sources (running time 14 minutes)
Inspection of Combustion Sources, Trainees Workbook (ICS, TW)
Inspection of Combustion Sources, Instructor's Manual (ICS, IRM)

SPECIAL INSTRUCTIONS.

The instructor should read the Instructor's Manual and preview the film in advance of the course. He should also preview the Trainee's Workbook. Care must be taken to use terminology similar to that found in the film and workbook. Before starting each unit of the film, be sure students have turned to the response forms in their workbook.

The student workbook includes an extensive study assignment with questions. In this course, there is no time for the reading as the previous evening was taken up with the nuisance case study. Some of the questions from the text might be extracted for verbally quizzing students at the appropriate times.

An experienced instructor may disagree on some of the film details. Use these points as discussion centers. Remember, all agencies differ somewhat in procedure and selects what is best for them. Be careful not to discredit the film just because you disagree with a few details.

SELECTED REFERENCES.

1. AP-40, Air Pollution Engineering Manual, US EPA, Office of Air Quality Planning and Standards Research Triangle Park, NC, 27711 - 1973. Out of print, but many libraries have copies.
2. Inspection Manual for Enforcement of New Source Performance Standards. Fossil-fuel-fired Steam Generators. EPA 340/1-75-002, Feb. 1975.
3. APTD-1101 Field Operations and Enforcement Manual for Air Pollution Control Volume II Control Technology and General Source Inspection. US EPA 1972.

AIR POLLUTION TRAINING INSTITUTE

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 1

NOTES

TIME SCHEDULE

Course: 444
Lecture Title: INSPECTION OF COMBUSTION SOURCES
FILM AND WORKBOOK LESSON 17

		Time Of Unit Min.	Ending Min.
I.	INTRODUCTION	2	2
II.	COMBUSTION GENERAL	3	5
III.	ELEMENTS OF COMBUSTION	8	13
IV.	FUELS AND FUEL FIRING	5	18
V.	FURNACE INTERIOR INSPECTION	2	20
VI.	MONITORING THE COMBUSTION PROCESS	5	25
VII.	NOTES ABOUT OPACITY	5	30
VIII.	INTRODUCE FILM	5	35
IX.	SHOW THE FILM	30	65
X.	DISCUSSION OF THE FILM	20	85
XI.	SUMMARY	5	90

CONTENT OUTLINE

Page 1 of 8

NOTES

Course: 444 LESSON 17

Lecture Title: INSPECTION OF COMBUSTION SOURCES FILM AND WORKBOOK

I. INTRODUCTION

Combustion sources are in all jurisdictions.

Q. How many FEOs do not have a Combustion Source under surveillance?

A. The Workbook and Film.
This is constructed as a self-contained unit. It is used here as a demonstration of basic inspection procedures.

Workbook has four chapters.

Chapter 1. - Elements Necessary for Good Combustion
Chapter 2. - Operation of Equipment to be Inspected Namely, two coal burning and one oil burning plant, and the applied Air Pollution Control equipment.
Chapter 3. - Inspection Points and Observations
Chapter 4. - Sources Being Inspected

The Film demonstrates the inspection practice and uses three Data Collection Forms, one for each source, on which student enters certain decisions which would become part of an inspection report.

After each film unit, there is discussion of decisions made.

B. Purpose of Combustion Lecture
When given as an independent course, the student would self-study the Workbook. The lecture in part replaces the self-study as a preparation for the film section.

It is the basics of combustion.

II. COMBUSTION GENERAL

ICS, TW Chapter 1.

Since many FEOs should have some knowledge of combustion, a good format for this unit is question and answer.

Q. What are the combustible elements in all fuels?

A. Carbon, hydrogen and sulfur.

Q. Are there both harmless and harmful products of the combustion reaction? Name the products (emissions) and the associated element.

A. Harmless - CO_2 from C
H_2O from H

Harmful - SO_2 from S
CO from C

COMBUSTION REACTION	HEAT GENERATED BTU/Kg fuel
$2C + O_2$ --- $2CO$	14 207
$C + O_2$ --- CO_2	32 228
$2H_2 + O_2$ --- $2H_2O$	136 868
$S + O_2$ --- SO_2	8 882

Note that C to O to produce CO produces less than one-half the heat of C to CO_2. Power plants work hard to prevent CO for heat efficiency. They do a pretty good job.

Q. What criteria pollutant emitted from Combustion Sources is not in the above?

A. NO_x

Q. Where does NO_x (almost all NO) come from?

A. Reaction at high temperature of nitrogen and oxygen, both from the combustion air.

Stop question and answer here and go to lecture.

III. ELEMENTS OF COMBUSTION

A. 3 Ts & plus of Combustion
Time, Temperature, Turbulence plus oxygen

ICS, TW p. 6
(Note: Text omits time.)

B. Theoretical Air

Theoretical Air -
The amount of air needed to supply the exact amount of O_2 for complete combustion -- and no more.

CONTENT OUTLINE (CONT'D)

LESSON 17

C. Excess Air

Excess Air -
The air supplied to the furnace in excess of theoretical air.

Q. What equipment uses an excess of air? Why?

A. (a) Stationary fossil-fuel-fired combustion devices.

(b) To insure that all C goes to CO_2 for maximum heat generation.

IV. FUELS AND FUEL FIRING — ICS, TW Chapter 2

Give a general description of equipment to be inspected in the film.

A. Traveling-grate Spreader Stoker with front ash discharge — Figure 2.1

Point out primary air through plenum and secondary air through over fire air jets for turbulence.

B. Spreader Stoker installation with gravity fly-ash return — Figure 2.2

Added Comment.
Shows the stoker in a 2-drum boiler. Comment on relative position of Dust Collector, Economizer and ID Fan, and the significance of volume of flue gases related to exit gas temperatures.

C. Circular burners for firing pulverized coal. — Figure 2.3

Point out primary and secondary air.

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CONTENT OUTLINE (CONT'D)

LESSON 17

D. Cyclone Furnace

Figure 2.5

E. Circular register burner for oil burning

Figure 2.8

V. FURNACE INTERIOR INSPECTION

ICS, TW p. 38

- Furnace grate and thickness of fuel bed for Spreader Stoker
- Character of the clinker. Should be rather uniform fused chunks with an overall dimension about 5 inches maximum. Large hard clinkers 12 to 24 inches which must be broken up indicates excessive furnace temperature.
- Flame characteristics, all three units.
- Furnace walls and ash build up on tubes.
- For oil burners flame impingement on opposite furnace wall.
- Opening fire box doors. Do not open furnace doors or inspection port covers. Always have boiler operator or your guide do this.

VI. MONITORING THE COMBUSTION PROCESS*

ICS, TW p. 40

A. Air-fuel ratio. An automatic control system keeps the air flow in balance with the fuel being fed into the furnace.

B. Steam-flow/air-flow recorder.
It is difficult to automatically measure the fuel flow continuously and instantaneously.

Steam flow can be measured and since fuel flow varies directly as steam flow, steam flow is recorded on the same chart with air flow using different color inks; usually red for steam flow and green for air flow.

---

*See also Ref. 4, Chapter 4.

CONTENT OUTLINE (CONT'D)

LESSON 17

When the control system is properly set, the two pens parallel each other, either coinciding or separated by about one inch. Setting the pens apart makes for easier chart reading.

Steam-flow/air-flow pens calibrated to coincide and

Figure 3.3

Steam-flow/air-flow pens modified to show parallel traces.

Figure 3.4

Note: Some charts are continuous strip charts. In the film, the oil fired unit uses such a chart.

C. Excess Air Indication

ICS, TW p. 44

1. CO_2 Indicator or Recorder

Figure 3.5

CO_2 concentration recorded continuously.

Note: Most often CO_2 is checked manually with an Orsat or equivalent instrument.

2. Oxygen Analyzer

The trend is to use % Oxygen in the flue gases to indicate excess air.

Oxygen analyzers are continuous recorders or grab samples with Orsat.

D. Draft Indicators

Figure 3.6

An instrument panel board usually has a series of draft indicators for points along the air and combustion gas system.

Several points along the way are important.

- Pressure drop across a multi-cyclone collector will indicate its collection performance.
- Pressure over the fire indicates if furnace doors can be opened. Some units run at above atmosphere and gases will blow out inspection doors if opened.

Reproduced from best available copy.

CONTENT OUTLINE (CONT'D)

LESSON 17

E. Opacity Recorders

ICS, TW p. 39

Opacity Chart, 24 hr. (P 41)
Opacity Chart, Continuous Horizontal Strip Chart

Figure 3.1
Figure 3.2

F. On New Major Sources (Utility)

Continuous automatic monitoring systems for opacity, SO_2 and NO_x are being used.

G. Oil Burners

ICM, TW p. 37

Check oil preheat and atomization pressure gage for each nozzle.

A sample of fuel oil may be taken for sulfur analysis.

VII. SIGNIFICANCE OF COMBUSTION MONITORS

Summary of
ICM, TW
Chapter 3

A. Too much air indicated by high O_2 and low CO_2. Efficiency is lost with too much excess air. Manual gives values to compare.

Note: In some installations higher than usual excess air may be needed to overcome opacity violation.

B. Sudden Steam Load Swings

Sudden large scale load swings make controlling air-fuel ratio difficult. Greatest influences are sudden load increase to boiler overload or drastic reduction. Sustained low load (less than 60% of rating) on Spreader produces smoke.

C. Blowing flues

All coal and oil-fired boilers must be equipped with soot blowers to remove deposited ash and carbon from the boiler tubes. Soot blowing generally results in opacity greater than allowed for short periods of time. Usually three minutes in one hour are exempted from the opacity regulation to permit soot blowing.

CONTENT OUTLINE (CONT'D)

LESSON 17

D. Opacity — ICM, TW p. 37

Plume opacity is a good indication of the combustion conditions. — Table 3.1

Plume Characteristics and Operating Permits

VIII. INTRODUCE FILM

Film is in three parts, each part demonstrating a different combustion system. The lecture covered many points, but there are others demonstrated. — ICM, TW Chapter 4

Part I Utility Boiler with Pulverized Fuel and ESP. Cyclone furnace is demonstrated.

Part II Spreader Stoker with Multi-Cyclone Collector on Industrial Power Plant.

Part III Oil Fired Utility Boiler with no Collector.

A. Demonstrates step by step Inspection Points.

Plume observation before entry
Fuel preparation
Furnace interior
Control panel instrumentation
Fans and duct work
Ash disposal system
Air Pollution Control devices

B. Explain reporting forms

Figure 1.* Examples of the three to be used while viewing the film.

* Instructor's Manual p.4

C. After each part, the film will be stopped and student answers will be compared with "text book" answers.

Discuss significance of answers.

D. Call for Questions.

CONTENT OUTLINE (CONT'D)

LESSON 17

IX. SHOW THE FILM

Be prepared to stop film where called for. Twice during the film.

Pulverized Coal	-	Reporting Form	ICM, TW p. 55
Spreader Stoker	-	Reporting Form	ICM, TW p. 64
Ore Burner	-	Reporting Form	ICM, TW p. 73

X. DISCUSS FILM

A. Review each inspection report.

ICM, IRM
Data Sheets
p. A-9
p. A-10
p. A-11

B. Call for questions. The instructor should have a series of questions built around his own particular expertise. The following are some examples of the type of questions which will generate discussion.

1. How did you react to the personal appearance of the FEO?

A. Observation - He was very neatly dressed, suit and tie, and had his own hard hat.

2. What did you note about his vehicle?

A. He was driving a standard passenger car. Would an "official" car have been an improvement?

3. What was your reaction to the interior firebox inspection?

A. Observation - Try to get experienced FEO's to express opinion. This is very difficult to do.

4. Should a plant be denied a Certificate of Operation because it has CO_2 too low or CO_2 too high?

A. Definitely not. These are informative.

XI. SUMMARY

The instructor prepares his own summary.

DATA COLLECTION FORM: PULVERIZED COAL BURNER

1. RECORD PERCENT OF OPACITY HERE: 30%*

	CHECK ONE	
RATE CONDITION OF:	SATISFACTORY	UNSATISFACTORY
2. STEAM FLOW	X	
3. OPACITY CHART	X	
4. CO_2 CONCENTRATION	X	
5. FLAME CONDITION	X	
6. FURNACE WALLS		X
7. FANS AND DUCT WORK	X	
8. ASH DISPOSAL		X
9. CONVEYOR SYSTEM	X	
10. WINDBLOWN EMISSIONS	X	

*Because the standard error of measurement is 15%, correct answers may range from 15% to 45%.

DATA COLLECTION FORM: SPREADER STOKER

1. RECORD PERCENT OF OPACITY HERE: 60%*

	CHECK ONE	
RATE CONDITION OF:	SATISFACTORY	UNSATISFACTORY
2. FLAME AND	X	
FUEL BED	X	
3. GRATES	X	
4. FURNACE WALLS		X
5. FUEL DELIVERY AND	X	
COAL SIZE	X	
6. OPACITY CHART		X
7. STEAM-FLOW/AIR-FLOW		X
8. CYCLONE EXTERIOR	X	
9. BOTTOM ASH	X	

RATE CONDITIONS AFTER VIEWING FILM		
10. $CO_2 = 10.5\%$	X	
11. OXYGEN = 6.7%	X	
12. PRESSURE DROP = 2 IN.	X	

*Because the standard error of measurement is 15%, correct answers may range from 45% to 75%.

DATA COLLECTION FORM: OIL BURNING EQUIPMENT

1. RECORD PERCENT OF OPACITY HERE: 0% *

	CHECK ONE	
RATE CONDITION OF	SATISFACTORY	UNSATISFACTORY
2. OPACITY CHART	X	
3. STEAM-FLOW/AIR-FLOW	X	
4. FIREBOX INTERIOR	X	
5. FORCED DRAFT FANS	X	
AND DUCT WORK	X	

RATE CONDITIONS AFTER VIEWING FILM		
6. BOILER #1: $O_2 = 11\%$		X
7. BOILER #2: $O_2 = 7\%$		X

*Because the standard error of measurement is 15%, correct answers may range from 0% to 15%.

LESSON 18

EMERGENCY AND ALERT PROCEDURES

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 18

EMERGENCY AND ALERT PROCEDURES

COURSE: 444
LESSON TIME: 30 min.
PREPARED BY: C. W. Gruber
DATE: 1/19/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL.	To describe the conditions which create emergency situations and the FEO response to such emergencies.
LESSON OBJECTIVES.	At the end of this lesson, the student should be able to: 1. Differentiate between local emergencies and air pollution emergency episodes. 2. Explain the involvement of the FEO in local emergencies. 3. Give three examples of possible causes of local emergencies. 4. Name four stages of the Episode Plan Structure. 5. Explain the type of inspections required of the FEO during emergency episodes.
STUDENT PREREQUISITE SKILLS.	Same as previous lesson.
LEVEL OF INSTRUCTION.	Introductory level to review in general the kinds of emergencies in which the FEO becomes involved.
INTENDED STUDENT PROFESSIONAL BACKGROUND.	Same as previous lesson.

LESSON PLAN (CONT'D)

LESSON 18

SUPPORT MATERIALS, EQUIPMENT LISTS.	None.
SPECIAL INSTRUCTIONS.	More stress should be placed on local emergencies than the general air pollution episode. However, it will be recognized that 30 minutes instruction for this subject will permit only the broadest of treatment.
REFERENCES.	Student Manual, Chapter 15

CONTENT OUTLINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Page 1 of 4

NOTES

Course: 444

LESSON 18

Lecture Title: EMERGENCY AND ALERT PROCEDURES

AIR POLLUTION EPISODES

I. INTRODUCTION

SM p. 15-2

Emergencies are

- Local Episodes
- Air Pollution Emergency Episodes, General.

II. LOCAL EMERGENCIES

SM p. 15-2

Caused by process upset or failure such as

- Explosion or fire
- Safety valve lifting
- Sudden failure of control device with by-pass
- Mechanical breakdown
- Radiation accidents
- Transportation accidents

III. GENERAL AIR POLLUTION EMERGENCY EPISODES

SM p. 15-3

Triggered by

- Very unfavorable meteorology
- Build-up of pollutants toward "significant harm" levels of contaminants in air.

All SIP must have plan which contains

- Episode criteria
- Surveillance system
- Emission Reduction Plan
- Communication System
- Legal Authority.

Significant harm levels are set by EPA (40 CFR 51.16 (a)) as — SM p. 15-3

SO_2 - 2,620 ug/m^3 (1.0 ppm), 24-hr. avge.

Particulate - 1000 $\mu g/m^3$ or 8 COH_s, 24-hr. avge.

Product ($TSP \cdot SO_2$) - $\left.\begin{array}{l} 490 \cdot 10^3 (\mu g/m^3)^2 \\ 1.5\ COH_s \cdot ppm \end{array}\right\}$ 24-hour avge.

O_3 - 1,200 $\mu g/m^3$ or 0.6 ppm 1-hr. avge.

CO - 57.5 mg/m^3 (50 ppm), 8-hr. avge.
86.3 mg/m^3 (75 ppm), 4-hr. avge.
144 mg/m^3 (125 ppm), 1-hr. avge.

NO_2 - 3,750 $\mu g/m^3$ (2.0 ppm), 1-hr. avge.
938 $\mu g/m^3$ (0.5 ppm), 24-hr. avge.

A. Episode Plan Requirements — SM p. 15-3

The episode plan must contain:

- Episode criteria
- Surveillance system
- Emission reduction plan
- Communication system
- Legal authority

B. Episode Structure — SM p. 15-3

A four-stage episode structure is generally adopted to meet the plan requirements. The stages in order are Forecast, Alert, Warning, Emergency.

Figure 18-1 shows the Air Pollution Episode Sequence suggested by 40 CFR 51.16 and Appendix L.

CONTENT OUTLINE (CONT'D)

LESSON 18

FORECAST, ALERT, WARNING, EMERGENCY SM p. 15-4

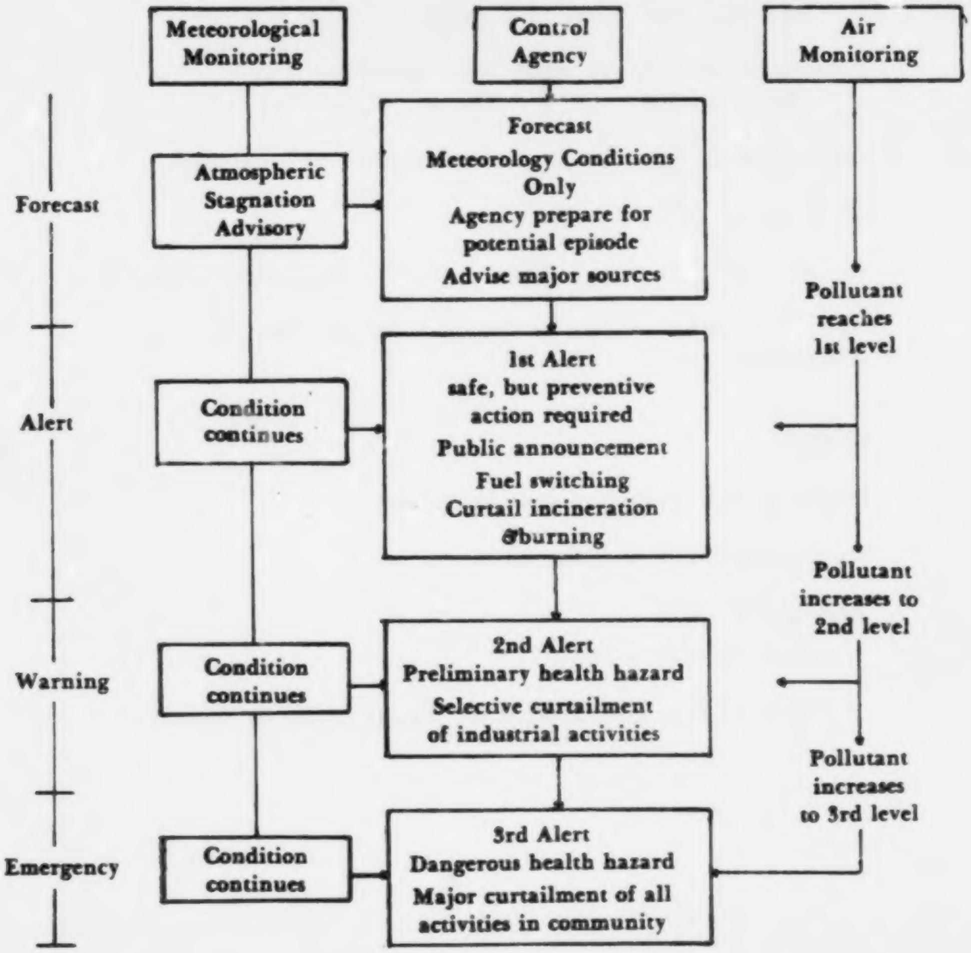

Meteorological Monitoring
Control Agency
Air Monitoring
Forecast
Alert
Warning
Emergency
Atmospheric Stagnation Advisory
Forecast
Meteorology Conditions Only
Agency prepare for potential episode
Advise major sources
Pollutant reaches 1st level
Condition continues
1st Alert
safe, but preventive action required
Public announcement
Fuel switching
Curtail incineration &burning
Pollutant increases to 2nd level
Condition continues
2nd Alert
Preliminary health hazard
Selective curtailment of industrial activities
Pollutant increases to 3rd level
Condition continues
3rd Alert
Dangerous health hazard
Major curtailment of all activities in community

Figure 15-1. Emergency episode, sequence procedure. "...To prevent ambient pollution concentrations from reaching levels which could cause significant harm to the health of persons..."

CONTENT OUTLINE (CONT'D)

LESSON 18

IV. RESPONSE IN EMERGENCIES

SM p. 15-3

Must be out-of-the-ordinary.

Action by FED at scene.
    May call for technical help.

Interface with other emergency services, as fire, police, civil defense.

Knowledge of sources in his district very helpful.

Also contacts with sources.

In General Emergency, FED enforces curtailment plans.

Must know what action he takes when sources fail to cooperate.

V. SUMMARY

SM p. 15-5

Training and planning are important.

Don't wait till the day arrives.

Especially know -
- What he has to do.
- What action he takes when people fail to comply.

LESSON 19

SOURCES OF TECHNICAL INFORMATION
FURTHER TRAINING OPPORTUNITIES

LESSON PLAN

AIR POLLUTION TRAINING INSTITUTE

TOPIC: LESSON 19
SOURCES OF TECHNICAL INFORMATION
FURTHER TRAINING OPPORTUNITIES

COURSE: 444
LESSON TIME: 15 min.
PREPARED BY: C. W. Gruber
DATE: 1/19/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LESSON GOAL.	To give the students a list: (a) of technical documents relating to enforcement and (b) of recommended EPA Training Courses for further study.
LESSON OBJECTIVES.	At the end of this lesson, the student should be able to: 1. Select from the technical literature available, those manuals which will be helpful for continued study. 2. Identify the various EPA training courses which would be beneficial in advancing enforcement proficiency. 3. To create a desire for further study and training.
INTENDED STUDENT PROFESSIONAL BACKGROUND.	Same as previous lesson.
SUPPORT MATERIAL EQUIPMENT LISTS.	35 mm slide projector and screen Blackboard Handout to be placed in blue folder at course beginning. EPA - NEED AIR POLLUTION INFORMATION? EPA CHRONOLOGICAL SCHEDULE OF AIR POLLUTION TRAINING COURSES
SPECIFIC INSTRUCTIONS.	This is an interest building presentation.
SELECTED REFERENCES.	See above.

CONTENT OUTLINE

Course: 444 LESSON 19

Lecture Title: SOURCES OF TECHNICAL INFORMATION

Page 1 of

NOTES

FURTHER TRAINING OPPORTUNITIES

I. SOURCES OF TECHNICAL INFORMATION

SM p. B-1

- Displayed on library table during course.
- See list in Student Manual.
- Pick those applicable to your individual needs - order them - read them.
- See pamphlet - "Need Air Pollution Information?" Explains Library Service of EPA at Research Triangle Park -- Use it.

II. AIR POLLUTION TRAINING COURSES

SM p. B-2

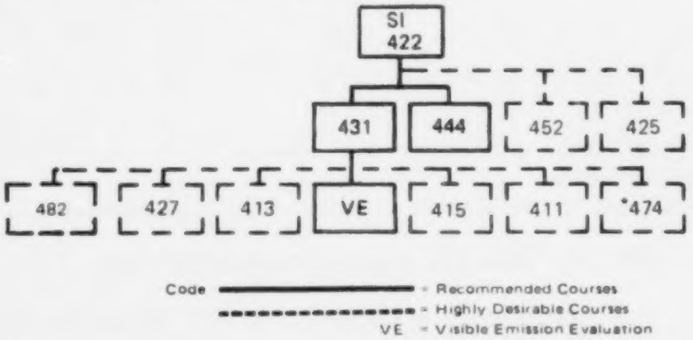
Instructor should have catalogue. Supply of catalogues should be available to students.

- Mention catalog.
- Show "Sequence of Courses" for Field Inspection.

413, 415, 482 are quite technical in control equipment application; 450 is source sampling for particulates and so on. See Figure 19-1 for a recommended sequence of Courses for Field Inspection.

Figure 19-1 Field Inspection Course Sequence

For individuals who are involved in field inspection and enforcement in a governmental agency.



In addition to the courses shown above, the following courses are suggested for further job enrichment, based upon an individual's job and interests:

SI 406 435 SI 448 450 463 468 483

*Recommended for those who inspect continuous emission monitors.

A catalog of available training course is published annually by the APTI. Information on training programs can be obtained by writing:

U.S. Environmental Protection Agency
Control Programs Development Division
Air Pollution Training Institute
MD 20 - Research Triangle Park, NC 27711.

CONTENT OUTLINE (CONT'D)

LESSON 19

Comment:

* 431 can be taken following 444.

* 452 - is a good basic air quality management course.

* VE is a must.

* 413 and 415 are quite technical for FEO's - more for engineers.

* 425 - good for more legal aspects training.

* 427 - combustion evaluation.

III. OTHER ADVANCED TRAINING — SM p. B-2

A. Advanced degree programs.
Plug EPA Traineeships as available when course is given.

B. Continuing Education Courses.
Colleges and Universities

C. Attendance at Technical Meetings.

D. Read Technical Journals, Reports, published Books.

IV. ASK FOR QUESTIONS OR COMMENTS.

COURSE SUMMATION.

Each Course Moderator prepares his own course summation.

Note: The film, Lesson 17, Inspection of Combustion Sources is a good basis for a Course Summation. In reviewing the film, the Course Director should note the actions of the FEO and use these as the skeleton of his closing remarks.

FINAL TEST (TEST NO. 3)

Use same format as Tests 1 and 2.

After all tests are in, review tests, giving correct answers and answer questions.

COURSE CRITIQUE.

Alternate plans are available.

Plan A. If there is plenty of time left, and students are not "restless" to leave, hold critique until after Test Review.

Plan B. If time is short or Course Director elects, as soon as a student turns in a completed answer sheet for Test 3, give the student a Critique Form. Hold the Test 3 Review until all Critiques are in.

COURSE CLOSING.

Bid students farewell.

Hope they will do their job better for having attended this course.

Engage in light talk.

When last student departs, Course Director indulges in a huge sigh of relief and starts packing.

END IRM, COURSE 444.

ANSWER KEY

AIR POLLUTION FIELD ENFORCEMENT

COURSE #444

TEST NO. 3

33 questions - Time 30 minutes.

Circle the correct response for either True/False or Multiple choice questions. There is only one correct answer for each question. For each wrong answer, three points will be deducted from 100 to give the test grade.

Put your answers on the answer sheet, also your name, and turn it in when completed.

Papers will be collected 30 minutes after beginning of test.

1. Canvassing of a neighborhood to obtain added complainants should be done by the FEO in response to a complaint from one individual. T [✓ F]

2. Mrs. Bradley Jones lives near the ABC Chemical Company. She repeatedly calls and complains of odors. No other citizens complain. Is the agency obligated to bring court action against the ABC Company to abate a public nuisance? Yes [✓ No]

3. Complaints can be caused by
   - a. specific visible emission violation
   - b. fugitive dust from construction or industrial sources
   - c. a general bad atmospheric condition causing high build up of contaminants
   - [✓ d.] all of the above

4. Which of the following pieces of data is least likely to be obtained in interviewing a complainant?
   - a. the frequency of the annoyance causing the complaint
   - b. the name and location of the suspected source of the complaint
   - [✓ c.] the specific process within the source facility causing the nuisance
   - d. time of the day the nuisance was first noted

5. During an inspection in response to a complaint, the FED:

   a. always identifies the complainant by name when requested for such identification.

   b. inspects only permit units

   [✓ c.] inspects first what might have caused the complaint and then other processes if circumstances warrant

   d. determines only who ownes the facility

6. The odor sensitivity of all persons is usually the same. T [✓ F]

7. Which of the following is the least valuable to the FED in dealing with odor nuisance?

   a. identifying the odor source

   [✓ b.] identifying the chemical composition of the odorant

   c. rating the odor intensity

   d. establishing the frequence of the odor nuisance occurrence

8. Odors may be characterized by four parameters: acceptability, pervasiveness, intensity and quality. [✓ T] F

9. Neighborhood complaint of natural gas in the air could be caused by an industrial release of mercaptan. [✓ T] F

10. A sample of exhaust air containing less than one odor units per cubic foot has no detectible odor. [✓ T] F

11. Which of the following does not characterize the transport of odorous effluent from source to receptor?

    a. odor flows downwind from source to receptor

    b. in unfavorable meteorology, odors travel long distances

    c. odors are transported as in a plume

    [✓ d.] odors leave a residual so they can be traced at a later time

12. In a source system, the air pollution control device is the only important element. T [✓ F]

13. The entrance to the source systems is a boiler, a reaction vessel or a series of collection hoods. [✓ T] F

14. Dust spilling from a collection hood indicates the inflow of air has insufficient volume. [✓ T] F

15. Which of the following is not a fan inspection point?

a. rpm
[✓ b.] width of the fan blade
c. motor amperes
d. fan vibration

16. All air contaminants removed by control equipment can be disposed of by landfilling, if properly covered. T [✓ F]

17. Which of the following type of collector is not well suited to collect particulates?

[✓ a.] absorption (packed) towers
b. scrubbers
c. centrifugal separators
d. fabric filters

(18. thru 23.) The mechanism for contaminant removal (operating characteristic) is different in seven types of air pollution control devices. These operating characteristics are listed and numbered one through seven as follows:

1. Separation by centrifugal force
2. Direct sieving of particles
3. Separation by electrical forces
4. Impaction on liquid droplets
5. Mass transfer to a solid surface
6. Chemical reaction (oxidation) of the contaminant
7. Changing the contaminant from a vapor to a liquid state

In the space provided, circle the number identifying the operating characteristic of each of the following collectors:

Example: electrostatic precipitator 1 2 [✓ 3] 4 5 6 7

18. fabric filter 1 [✓ 2] 3 4 5 6 7
19. condenser 1 2 3 4 5 6 [✓ 7]
20. cyclone [✓ 1] 2 3 4 5 6 7
21. venturi scrubber 1 2 3 [✓ 4] 5 6 7
22. adsorber 1 2 3 4 [✓ 5] 6 7
23. thermal incinerator (after-burner) 1 2 3 4 5 [✓ 6] 7

(24. thru 28.) Match the inspection point to the control device. Circle the correct inspection point.

Inspection point

1. pressure drop across the collector (ΔP)
2. electrical power (voltage and current) output from the rectifier
3. outlet gas temperature

The same inspection point may apply to more than one collector.

24.	thermal incinerator	1	2	[✓ 3]
25.	venturi scrubber	[✓ 1]	2	3
26.	electrostatic precipitator	1	[✓ 2]	3
27.	cyclone separator	[✓ 1]	2	3
28.	catalytic incinerator	1	2	[✓ 3]

29. A steam flow-air flow meter indicates how the air flow changes as the flow of fuel to the firing device changes. [✓ T] F

30. A high air-fuel ratio produces a high percentage of CO_2 in the combustion gases. T [✓ F]

31. In asphalt concrete batch plants, moisture is removed from the aggregate in the:

a. hot elevator
[✓ b.] rotary dryer
c. mixing tower
d. pugmill

32. The pressure drop (ΔP) across a collector can be determined by subtracting the reading on the inlet pressure gauge from the reading on the outlet pressure gauge when the fan is down stream from the collector. [✓ T] F

33. An FED should always "blow his cool" whenever a boiler operator blows his flues. T [✓ F]

AIR POLLUTION FIELD ENFORCEMENT

COURSE #444

TEST NO. 3

Name (ANSWER KEY)

1. True [✓ False]
2. Yes [✓ No]
3. a b c [✓ d]
4. a b [✓ c] d
5. a b [✓ c] d
6. True [✓ False]
7. a [✓ b] c d
8. [✓ True] False
9. [✓ True] False
10. [✓ True] False
11. a b c [✓ d]
12. True [✓ False]
13. [✓ True] False
14. [✓ True] False
15. a [✓ b] c d
16. True [✓ False]
17. [✓ a] b c d
18. 1 [✓ 2] 3 4 5 6 7
19. 1 2 3 4 5 6 [✓ 7]
20. [✓ 1] 2 3 4 5 6 7
21. 1 2 3 [✓ 4] 5 6 7
22. 1 2 3 4 [✓ 5] 6 7
23. 1 2 3 4 5 [✓ 6] 7
24. 1 2 [✓ 3]
25. [✓ 1] 2 3
26. 1 [✓ 2] 3
27. [✓ 1] 2 3
28. 1 2 [✓ 3]
29. [✓ True] False
30. True [✓ False]
31. a [✓ b] c d
32. [✓ True] False
33. True [✓ False]

TEST EVALUATION - Check one box each line. This test has been:

Too long ☐ About right ☐ Too short ☐

Too hard ☐ About right ☐ Too easy ☐

APPENDIX

TESTS AND ANSWER SHEETS

This section contains Tests 1, 2 and 3 and the Answer Sheets to be handed out to the students at the conclusion of the various exercises.

Tests and Answer Sheets must be reproduced in sufficient quantities to give out one per student. Each set of test papers and Answer Sheets should be stapled.

One copy of each Answer Key is found in the Instructor's Manual in the appropriate chronological place.

AIR POLLUTION FIELD ENFORCEMENT

COURSE #444

TEST NO. 1

33 questions - Time 25 minutes.

Circle the correct response for either True/False or Multiple Choice questions. There is only one correct answer for each question. For each wrong answer, three points will be deducted from 100 to give the test grade.

Put your answers on the answer sheet, also your name, and turn it in when completed.

Papers will be collected 25 minutes after beginning of test.

1. Air Quality Control Programs in the U.S. are prescribed by
    a. the Federal Clean Air Act alone
    b. State legislative action only
    c. State legislative action and the Federal Clean Air Act
    d. Local regulations alone

2. The scope of a field operation program depends upon
    a. the number and types of stationary sources
    b. the agency level, i.e., local, state, federal
    c. the complexity of rules and regulations
    d. all of the above

3. Which of the following is least related to the field enforcement process?
    a. ambient air quality monitoring
    b. compliance plan inspection
    c. requiring periodic re-inspection of sources
    d. district surveillance

4. In proceeding from one inspection to another, it is not necessary for the FED to exercise surveillance because he is specifically assigned to source inspection. T F

5. The term opacity means the degree to which transmitted light is reduced. T F

6. Atmospheric particulates, larger than 20μ, can be sampled with sticky paper. T F

7. Upon entering a plant for the first time, it is proper procedure to obtain a search warrant in advance to insure gaining entry. T F

8. Before making an inspection for any purpose, it is considered unnecessary to

   a. consult the source file if available

   b. form a plan before entering

   c. always phone ahead and make an appointment

   d. obtain the name of the facility contact person, if available

9. Tasks assigned to the FED most always include

   a. functioning as a working member of a source test team

   b. investigating citizen complaints

   c. operating the ambient air quality network

   d. personally serving notices of violation

10. Which of the following are considered effective enforcement actions?

    a. filing a civil or criminal suits

    b. notice of violation with orders to abate

    c. revoking a permit to operate

    d. all of the above

11. A source in "continuing" compliance requires minimal surveillance. T F

12. Enforcement actions following an observed violation are left entirely to the judgment of the FED. T F

13. Protection against the adverse effects on public health and welfare is the only goal of the Federal Clean Air Act. T F

14. Ambient Air Quality results only from the sum of emissions from sources plus atmospheric reaction products. T F

15. An enforcement policy guides the FED

   a. in the types of equipment subject to the permit regulations
   b. in the percent opacity which constitutes a violation
   c. in the action he takes following an observed violation
   d. all of the above

16. Which of the following contaminants is not emitted directly from sources?

   a. photochemical oxidants (O_3)
   b. particulates
   c. hydrocarbons
   d. carbon monoxide

17. The ultimate success or failure of the enforcement program depends heavily upon

   a. the manner of issuing a violation notice
   b. how well the FED does his job
   c. whether the air pollution control program is state or local
   d. all of the above

18. Which of the following does not apply to the FED's job conduct?

   a. an official vehicle must be used for field work
   b. communication is more than people talking to each other
   c. effective communications may prevent friction
   d. dress and appearance are important

19. The FED does a better job if he develops a potential for legal enforcement. T F

20. The most important part of a newly hired FED's orientation program, during his first week on the job, is to obtain certification as an opacity observer. T F

21. Prior to making a periodic source inspection, it is good practice to make an observation of the source exterior, even though extra time is required. T F

22. Which of the following is not an observable manifestation of certain non-compliance during surveillance of a district?

  a. emission of excessive carbon monoxide

  b. evidence of new construction for which no permit has been obtained

  c. plumes of readable opacity

  d. none of the above

23. Assuming you are in a remote part of your territory and you have no prior contact with a source facility, and you observe a visible emission violation from what you assume to be power house chimney, you should

  a. go back to headquarters to see if there is a record on the facility

  b. go to the facility entrance and ask to see the boiler operator

  c. go to the facility and request to see the resident manager

  d. hope the guard at the gate does not request identification

24. In making an opacity reading, the FEO should look constantly at the plume to detect changes that may occur during the observation. T F

25. Before deciding a condition is non-compliance, the FEO must relate the facts to the specifics of a rule or regulation. T F

26. A notice of violation must be delivered in person to the highest ranking official present at a plant determined to be in violation of a control regulation. T F

27. Where breakdown is given as a cause of violation, it is important to

  a. probe the event for signs of the emergency

  b. analyze the situation against the regulation relating to emergencies

  c. assess the frequency of breakdowns of a similar nature from this source

  d. all of the above

28. An inspection report is always better if it is a lengthy report. T F

29. At the initial plant inspection, you should obtain

  a. the name of the secretary to the manager

  b. the number of employees in the company

  c. the present legal owner of the source

  d. none of the above

30. Which of the following is unnecessary in documenting a visible emission violation?

  a. beginning and ending time of the observation

  b. location of the source

  c. position of the sun with respect to observer and source

  d. the construction permit number and date

31. After learning the rules and regulations, administrative procedures and policies, the FED is not concerned with any further training. T F

32. When inspecting a dry type Portland cement plant, it is important to

  a. record key instrument readings and relate them to permit data.

  b. form judgements on fugitive dust emissions

  c. form judgements on the adequacy of control equipment maintainence.

  d. all of the above

33. In a dry type Portland cement plant, a major problem is the emission of

  a. hydrocarbons

  b. nitrogen oxides

  c. fugitive dusts

  d. all of the above

AIR POLLUTION FIELD ENFORCEMENT

COURSE #444

TEST NO. 1

Name ______________________________

1. a b c d
2. a b c d
3. a b c d
4. True False
5. True False
6. True False
7. True False
8. a b c d
9. a b c d
10. a b c d
11. True False
12. True False
13. True False
14. True False
15. a b c d
16. a b c d
17. a b c d
18. a b c d
19. True False
20. True False
21. True False
22. a b c d
23. a b c d
24. True False
25. True False
26. True False
27. a b c d
28. True False
29. a b c d
30. a b c d
31. True False
32. a b c d
33. a b c d

TEST EVALUATION - Check one box each line. This test has been:

Too long ☐ About right ☐ Too short ☐

Too hard ☐ About right ☐ Too easy ☐

AIR POLLUTION FIELD ENFORCEMENT

COURSE #444

TEST NO. 2

25 questions - Time 25 minutes.

Circle the correct response for either True/False or Multiple Choice questions. There is only one correct answer for each question. For each wrong answer, four points will be deducted from 100 to give the test grade.

Put your answers on the answer sheet, also your name, and turn it in when completed.

Papers will be collected 25 minutes after beginning of test.

1. Which of the following is to be considered in determining the legality of a regulation for the control of emissions?
    a. the emission inventory
    b. opacity standards
    c. legislative authority to adopt
    d. the Hearsay Rule
2. Which of the following is common to both administrative and court proceedings?
    a. evidence presented must be relevant
    b. a jury may be used to decide the facts
    c. relaxing of strict rules of evidence
    d. circumstantial evidence is preferable to direct evidence
3. Which of the following relates directly to the admissibility of evidence in a court trial or administrative hearing?
    a. Hearsay rule
    b. Relevancy
    c. Best evidence rule
    d. All of the above

4. Which of the following is not good advice for a witness about to testify in court?

   a. think before responding to a question

   b. speak slowly and distinctly on the witness stand

   c. Refuse to be ashamed or startled into giving an answer you did not intend to give

   d. memorize your testimony so you will forget none of the details

5. Which of the following is good advice for a witness about to testify in court?

   a. Read directly from your notes - you will be more accurate

   b. expand upon the facts to give interpretations of the attorneys' questions

   c. Never hesitate to frankly admit that you do not remember a certain physical fact

   d. If you are testifying as an expert witness, do not hesitate to give long and detailed accounts of your accomplishments so as to impress the judge or jury.

6. Expert witnesses may rely on hearsay in forming opinions within the area of their expertise. T F

7. Before a nonexpert witness can testify in a courtroom proceeding, he must testify as to his education, background, and training. T F

8. The formal rules of evidence consider a photograph better evidence of a given situation than the eye witness testimony of an observer. T F

9. If a witness gives testimony in a non-jury courtroom proceeding which violates a rule of evidence, the judge will refuse to consider the specific testimony in deciding the case. T F

10. Under the Federal Clean Air Act of 1967, as amended in 1970 and 1977, the Federal Government has primary responsibility for the enforcement of emissions standards for existing stationary sources. T F

11. It is considered unethical for an air pollution control officer to consult with his attorney before testifying in a courtroom or administrative proceeding. T F

12. When an agency successfully obtains a court order that includes a strict compliance schedule, everyone in the agency can relax because now the violation, with certainty, will be abated. T F

13. As a prosecuting (plaintiff) witness to an opacity violation court case, your testimony is

    a. immune from cross-examination

    b. given as direct testimony of the violation

    c. valid because you are a field enforcement officer

    d. valid only if you present a photograph of the emission

14. The authority to control air pollution in a state or local agency must be provided by the:

    a. Governor

    b. State legislature

    c. EPA

    d. President

15. Under Prevention of Significant Deterioration (PSD), Federal review of new construction permits for major sources is not required

    a. in attainment areas touching a non-attainment area

    b. in non-attainment areas

    c. where sources have an emission potential of less than 100 tons per year in non-attainment areas

    d. where the emission potential is 300 tons per year.

16. When prosecuting a violation of an emission standard, it is also necessary to prove injury to public health. T F

17. Founding air pollution control legislation on need to protect public health is constitutionally valid. T F

18. In a criminal action, the violation is proven by presenting a preponderance of the evidence. T F

19. A deposition serves as

    a. a fishing expedition to try to determine what the witness knows

    b. a report by the FED to his superior

    c. a violation of large particulates falling on a residence

    d. a summation of the case by the defense attorney

20. Good case preparation should discover the evidence either side will present in court. T F

21. The 1977 Clean Air Act Amendments require enforcement action to be taken where there is a proven SIP violation. T F

22. A so-called Section 113 action begins with EPA presenting to the violating source, a compliance order. T F

23. The filing of a suit in court immediately follows when the EPA Washington legal staff approves the action. T F

Two constitutional amendments, the Fourth and the Fourteenth provide the guarantees stated in questions 24 and 25. Circle the amendment which applies to each guarantee.

24. Guarantees due process of law and equal protection. 4th 14th

25. Guarantees freedom from unreasonable search and seizure. 4th 14th

AIR POLLUTION FIELD ENFORCEMENT

COURSE #444

TEST NO. 2

Name ______________________

1. a b c d
2. a b c d
3. a b c d
4. a b c d
5. a b c d
6. True False
7. True False
8. True False
9. True False
10. True False
11. True False
12. True False
13. a b c d
14. a b c d
15. a b c d
16. True False
17. True False
18. True False
19. a b c d
20. True False
21. True False
22. True False
23. True False
24. 4th 14th
25. 4th 14th

TEST EVALUATION - Check one box each line. This test has been:

Too long ☐ About right ☐ Too short ☐

Too hard ☐ About right ☐ Too easy ☐

AIR POLLUTION FIELD ENFORCEMENT

COURSE #444

TEST NO. 3

33 questions - Time 30 minutes.

Circle the correct response for either True/False or Multiple choice questions. There is only one correct answer for each question. For each wrong answer, three points will be deducted from 100 to give the test grade.

Put your answers on the answer sheet, also your name, and turn it in when completed.

Papers will be collected 30 minutes after beginning of test.

1. Canvassing of a neighborhood to obtain added complainants should be done by the FEO in response to a complaint from one individual. T F

2. Mrs. Bradley Jones lives near the ABC Chemical Company. She repeatedly calls and complains of odors. No other citizens complain. Is the agency obligated to bring court action against the ABC Company to abate a public nuisance? Yes No

3. Complaints can be caused by
   a. specific visible emission violation
   b. fugitive dust from construction or industrial sources
   c. a general bad atmospheric condition causing high build up of contaminants
   d. all of the above

4. Which of the following pieces of data is least likely to be obtained in interviewing a complainant?
   a. the frequency of the annoyance causing the complaint
   b. the name and location of the suspected source of the complaint
   c. the specific process within the source facility causing the nuisance
   d. time of the day the nuisance was first noted

5. During an inspection in response to a complaint, the FED:

   a. always identifies the complainant by name when requested for such identification.

   b. inspects only permit units

   c. inspects first what might have caused the complaint and then other processes if circumstances warrant

   d. determines only who ownes the facility

6. The odor sensitivity of all persons is usually the same. T F

7. Which of the following is the least valuable to the FED in dealing with odor nuisance?

   a. identifying the odor source

   b. identifying the chemical composition of the odorant

   c. rating the odor intensity

   d. establishing the frequence of the odor nuisance occurrence

8. Odors may be characterized by four parameters: acceptability, pervasiveness, intensity and quality. T F

9. Neighborhood complaint of natural gas in the air could be caused by an industrial release of mercaptan. T F

10. A sample of exhaust air containing less than one odor units per cubic foot has no detectible odor. T F

11. Which of the following does not characterize the transport of odorous effluent from source to receptor?

    a. odor flows downwind from source to receptor

    b. in unfavorable meteorology, odors travel long distances

    c. odors are transported as in a plume

    d. odors leave a residual so they can be traced at a later time

12. In a source system, the air pollution control device is the only important element. T F

13. The entrance to the source systems is a boiler, a reaction vessel or a series of collection hoods. T F

14. Dust spilling from a collection hood indicates the inflow of air has insufficient volume. T F

15. Which of the following is not a fan inspection point?

a. rpm
b. width of the fan blade
c. motor amperes
d. fan vibration

16. All air contaminants removed by control equipment can be disposed of by landfilling, if properly covered. T F

17. Which of the following type of collector is not well suited to collect particulates?

a. absorption (packed) towers
b. scrubbers
c. centrifugal separators
d. fabric filters

(18. thru 23.) The mechanism for contaminant removal (operating characteristic) is different in seven types of air pollution control devices. These operating characteristics are listed and numbered one through seven as follows:

1. Separation by centrifugal force
2. Direct sieving of particles
3. Separation by electrical forces
4. Impaction on liquid droplets
5. Mass transfer to a solid surface
6. Chemical reaction (oxidation) of the contaminant
7. Changing the contaminant from a vapor to a liquid state

In the space provided, circle the number identifying the operating characteristic of each of the following collectors:

Example:	electrostatic precipitator	1	2	[✓ 3]	4	5	6	7
18.	fabric filter	1	2	3	4	5	6	7
19.	condenser	1	2	3	4	5	6	7
20.	cyclone	1	2	3	4	5	6	7
21.	venturi scrubber	1	2	3	4	5	6	7
22.	adsorber	1	2	3	4	5	6	7
23.	thermal incinerator (after-burner)	1	2	3	4	5	6	7

(24. thru 28.) Match the inspection point to the control device. Circle the correct inspection point.

Inspection point

1. pressure drop across the collector (ΔP)
2. electrical power (voltage and current) output from the rectifier
3. outlet gas temperature

The same inspection point may apply to more than one collector.

24.	thermal incinerator	1	2	3
25.	venturi scrubber	1	2	3
26.	electrostatic precipitator	1	2	3
27.	cyclone separator	1	2	3
28.	catalytic incinerator	1	2	3

29. A steam flow-air flow meter indicates how the air flow changes as the flow of fuel to the firing device changes. T F

30. A high air-fuel ratio produces a high percentage of CO_2 in the combustion gases. T F

31. In asphalt concrete batch plants, moisture is removed from the aggregate in the:

   a. hot elevator
   b. rotary dryer
   c. mixing tower
   d. pugmill

32. The pressure drop (ΔP) across a collector can be determined by subtracting the reading on the inlet pressure gauge from the reading on the outlet pressure gauge when the fan is down stream from the collector. T F

33. An FED should always "blow his cool" whenever a boiler operator blows his flues. T F

AIR POLLUTION FIELD ENFORCEMENT

COURSE #444

TEST NO. 3

Name ______________________

1. True False
2. Yes No
3. a b c d
4. a b c d
5. a b c d
6. True False
7. a b c d
8. True False
9. True False
10. True False
11. a b c d
12. True False
13. True False
14. True False
15. a b c d
16. True False
17. a b c d
18. 1 2 3 4 5 6 7
19. 1 2 3 4 5 6 7
20. 1 2 3 4 5 6 7
21. 1 2 3 4 5 6 7
22. 1 2 3 4 5 6 7
23. 1 2 3 4 5 6 7
24. 1 2 3
25. 1 2 3
26. 1 2 3
27. 1 2 3
28. 1 2 3
29. True False
30. True False
31. a b c d
32. True False
33. True False

TEST EVALUATION - Check one box each line. This test has been:

Too long ☐ About right ☐ Too short ☐
Too hard ☐ About right ☐ Too easy ☐

STUDENT EXERCISE NO. 1

SECTION I (LESSON 4)

ANSWER SHEET

TEAM Answer Key
4-1-79

MEMBERS SIGN:

1. Completed Visible Emission Observation Form. Do not turn in.

2. Enter on the Notice of Violation Form that information which is valid to this point in time.

3. The rule violated was 50 *
Aggregate (length) of violation 6½ minutes

4. The on-site inspection should produce the following information to complete the documentation of this violation.

    1. Owner-Management data
    2. Equipment & permit data
    3. Operator data.

* Note: Read Rule 50b. Only 2½ minutes of No 3 or less is exempted from the total of 9 minutes of No 1 or darker. So the time of the violation is 6½ min.

Answer Key 3/1/79

VISIBLE EMISSION OBSERVATION FORM

Source Name ______

Observer John 7 Hubbard

Address ______

Date 7/15/78

Observation Point: 75 ft w. of source.

Stack: Distance From 75' W Height 12'

Wind: Speed 5 mph Direction S

Sky Condition: Cloudy (assumed)

Color of Emission: black

Ambient Temp: Dry Bulb 80 °F (assumed)
Wet Bulb ______ °F

Relative Humidity: ______

Observation began 0815 Ended 0828

Observer's Signature: J Hubbard

Certification Date: 4/2/78

Comments:
Location from which observation was made was the only observation point available. Since sky was cloudy, the readings are acceptable. Note that only 80% (No4) density will be included in the opacity violation duration.

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15	5	5	5	5	45				
16	5	5	5	5	46				
17	5	4	4	4	47				
18	4	4	4	4	48				
19	4	4	4	4	49				
20	4	4	4	4	50				
21	4	4	3	3	51				
22	2	2	2	2	52				
23	1	1	1	1	53				
24	1/2	1/2	1/2	1/2	54				
25	1/2	1/2	1/2	1/2	55				
26	1/2	1/2	1/2	1/2	56				
27	0	0	0	0	57				
28					58				
29					59				

ANSWER KEY 4-1-79

Henderson County Air Pollution Control
Henderson, Ohio

CORP	
PART	
INDIV	

NOTICE OF VIOLATION

7-15-78
DATE OF VIOLATION

NAME

ADDRESS CITY

RE PREMISES AT

INSTALLING CONTRACTOR CITY

YOU ARE HEREBY NOTIFIED THAT PURSUANT TO SECTION Rule 50 OF THE HEALTH AND SAFETY CODE OF THE STATE OF OHIO A MISDEMEANOR HAS BEEN COMMITTED THROUGH THE discharge of air contaminants of an opacity in excess of that allowed from the stack of an incinerator for a duration of 6½ minutes

POINT OF OBSERVATION: 75 ft w. of the incinerator stack

WEATHER: Cloudy* WIND N E [✓ S] W

ARRIVAL: 08:15 AM

DEPARTURE: 08:22 AM

WAS SOURCE EMITTING VISIBLE DISCHARGE AT END OF OBSERVATION? YES ☐ NO ☑

R. No. OR OPACITY

EMISSION FROM: BASIC ✓ CONTROL OPEN FIRE

VISIBLE EMISSIONS OBSERVED

START		STOP		MIN.	R. No. % OP.	COLOR
08	15	08	17½	2¼	5	black
08	17½	08.	21½	4¼	4	black
08	21½	08	22	½	3	black
08	22	08	23	1	2	black
08	23	08	24	1	1	black

TOTAL 9 MIN.

Permit No.

SERVED TO

TITLE

Date of Service By

Sector

John Adams.
Director of Enforcement

By John Hubbard Badge No. 35

FRONT

* assumed

STUDENT EXERCISE NO. 1

SECTION II

LESSON 5

ANSWER SHEET

TEAM Answer Key

3-26-79

MEMBERS SIGN

____

____

____

____

1. List at least five important errors pertaining to different principles of good on-site inspection and investigative practice.

1. When advised by secretary to see Mr. Peterson, he should have asked "is he the person of highest authority on the premises?" If not, who is, and ask to see that person.
2. He should have asked Mr. Peterson's full name and official title. He may be a company officer or comptroller.
3. As soon as Hartley Div., Compton Metals is mentioned, he should get the corporate address of Compton Metals, as well as exact corporate name, and determine relationship of Hartley Div. to Compton Metals - an operating division or wholly owned subsidiary.
4. At the incinerator, as soon as Mr. Allen's name as plant manager was mentioned, he should get Allen's full name and title and inquire if he is on the premises now and see him before he leaves.
5. As soon as he notes Operating Permit is issued to Johnson Storage, he should have advised of the violation of Rule 10a (Operating Without a Valid Permit) since Rule 12 states "Permits are not transferable".
6. He should inquire about construction plans and advise of provisions of Rule 10a.
7. The time the inspector left the premises was not stated.
8. No information was given regarding the regulations.

STUDENT EXERCISE NO. 1

LESSON 5

ANSWER SHEET (CONT'D)

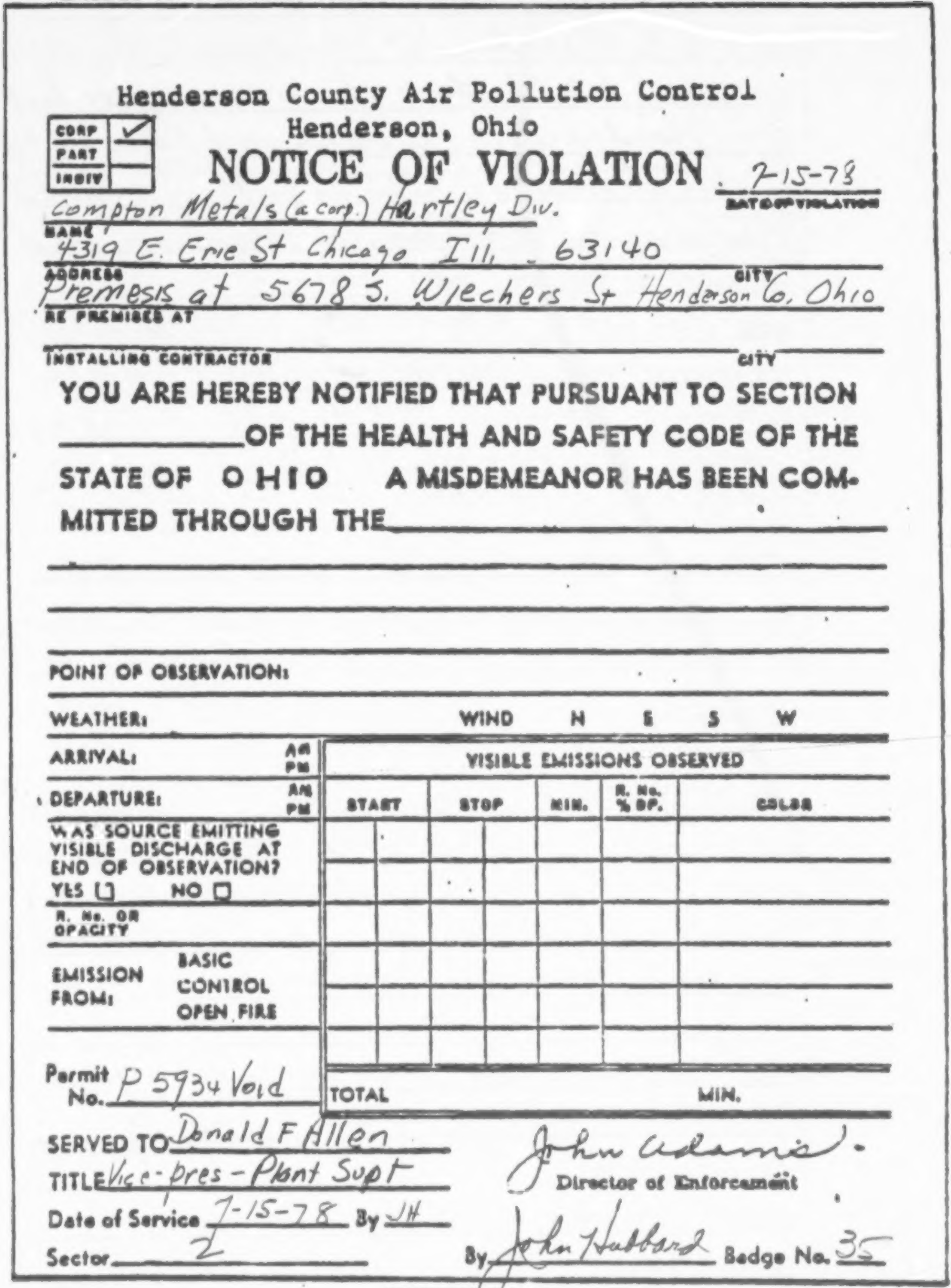
2. List the number of potential violations and specify the Rule which has been violated.

Rule	No. of Violations	Description
Rule 50	1	Opacity
Rule 10b	1	No operating permit for inc.
Rule 10a	4	2 hard chrome plating tanks
		1 blower & exhaust system
		1 degreasing tank

3. Complete the notice of Violation Form, front and back.

4. If so instructed, each Team is to turn in one completed Answer Sheet, signed by all members of the Team and one completed Notice of Violation Form, front and back.

EXAMPLE OF A PROPERLY EXECUTED NOTICE OF VIOLATION *



Henderson County Air Pollution Control
Henderson, Ohio

CORP ☑
PART ☐
INDIV ☐

NOTICE OF VIOLATION

7-15-78
DATE OF VIOLATION

NAME Compton Metals (a corp.) Hartley Div.

ADDRESS 4319 E. Erie St Chicago Ill. 63140 CITY

RE PREMISES AT Premesis at 5678 S. Wiechers St Henderson Co. Ohio

INSTALLING CONTRACTOR CITY

YOU ARE HEREBY NOTIFIED THAT PURSUANT TO SECTION __________ OF THE HEALTH AND SAFETY CODE OF THE STATE OF OHIO A MISDEMEANOR HAS BEEN COMMITTED THROUGH THE

POINT OF OBSERVATION:

WEATHER: WIND N E S W

ARRIVAL: AM PM

DEPARTURE: AM PM

WAS SOURCE EMITTING VISIBLE DISCHARGE AT END OF OBSERVATION?
YES ☐ NO ☐

R. No. OR OPACITY

EMISSION FROM: BASIC CONTROL OPEN FIRE

Permit No. P 5934 Void

VISIBLE EMISSIONS OBSERVED

START	STOP	MIN.	R. No. % OP.	COLOR

TOTAL MIN.

SERVED TO Donald F Allen
TITLE Vice-pres - Plant Supt
Date of Service 7-15-78 By JH
Sector 2

John Adams
Director of Enforcement

By John Hubbard Badge No. 35

FRONT

*This is information added to Violation Notice after on-site inspection. This data with that filled in after observation (Lesson 4) completes the notice. It is assumed that Mr. Allen, Plant Manager, was present and was contacted by Hubbard before he left the premises.

EXAMPLE OF A PROPERLY WRITTEN REPORT *

OPERATOR
Name & Address Zachary Peterson
5678 S. Wiechers ST Henderson Co Ohio 58316

HIS REMARKS I lit the fire this morning at about 8 am. I loaded the incinerator with debris left by the previous tennant: two 50 gallon drums of paint cans, styrofoam packing, creosoted wood timbers, fiberboard, paper, rubber and plastic waste. Mr Allen, the manager told me to burn them

WAS MANAGEMENT CONTACTED [✓ YES] NO

NAME Donald F Allen TITLE Vice President and plant manager

HIS REMARKS I asked Mr Peterson to get rid of the debris by burning in the incinerator. I thought the operating permit was good. I want to cooperate with the law and will not operate the permit any more until we have our operating permit.

FINDINGS (INCLUDING INSPECTOR'S FULL EXPLANATION OF VIOLATION)

I observed emissions in excess of No 1 Ringelmann from 8:15 to 8:24 AM. After 8:24 the density reduced to No 1 and lower. The source was found to be an Acme multiple chamber retort type, 75 lb/hr, incinerator w/a Lasken gas-fired secondary burner. Slightly smouldering burning pile about 2 ft in dia. x 1 ft high was observed containing burned out paint cans and residue of rubber and plastic materials. Secondary burner was not in operation. Incinerator was not in attendance during operation observation. During plant inspection, noted 4 pieces of equipment being installed w/o permit. See separate inspection report on equipment.

CORPORATE OFFICER

DRIVER'S LICENSE NO.

VACATION FROM TO

REQUEST FOR COMPLAINT SIGNED DATE

*It is to be assumed Mr. Allen, Plant Manager was present and was contacted by Hubbard before he left the premises.

Reproduced from best available copy.

ANSWER KEY

LESSON 11

SECTION IV - ACTUAL TRIAL QUESTIONS

The following questions are extracts from the courtroom record of the actual trial of a large smelting corporation for opacity and suspended particulate matter violations. Part A presents questions which were asked of the field enforcement officer testifying by his own agency's attorney. Part B consists of questions asked during the cross examination of the same officer by the defense counsel.

PART A - QUESTIONS ASKED OF THE FIELD ENFORCEMENT OFFICER BY HIS OWN AGENCY'S COUNSEL

1. Please state your name and address.
2. What is your position of employment?
3. How long have you been employed in your present capacity?
4. What are your duties as a field enforcement officer?
5. Please describe your educational background, your training and qualifications as a field enforcement officer.
6. Please state whether or not your have ever investigated the Columbia Smelting Company? Where is it located?
7. When did you investigate the plant?
8. What was the purpose of your visit?
9. What tests did you conduct? Who accompanied you?
10. What is suspended particulate matter? How do you test for it?
11. How long have you been taking high volume air samples?
12. What is the correct procedure for taking high volume air samples?
13. (Exhibit a high volume air sampler or photograph thereof.) How does a high volume air sampler work?
14. What is the purpose of the up-wind sampler?

15. Would you describe the physical characteristics of the plant and its boundaries with respect to other geographical features of the area, including residential or other land use-type areas. (Have him draw a map of the plant and surrounding area.)

16. Please describe in detail how you and your partner conducted the high volume air sample on January 15, 1972.

17. Describe what you did with sample after you completed the test.

18. How is a sampler tested for accuracy? Do you know whether or not the samplers used to test Columbia Smelting Company were accurately calibrated? Describe how and when said samplers were checked for accuracy.

19. Do you know whether or not the samplers were functioning correctly and accurately on January 15, 1972? (If someone else calibrated the samplers you may need to have him testify as to their accuracy. If someone other than the investigator did the weighing of the samples, you will need to have him testify as to the manner and accuracy of the weighing.)

20. Describe how you weighed the samples. How accurate is your balance? Do you know whether or not your balance was operating accurately? How did you check?

21. What was the weight of the sample paper before the test? What was the weight of the sample after the test? How long were the samplers run? What volume of air passed through the samplers? What is the up wind u/M^3? The downwind?

22. What is the net ug/M^3 of suspended particulate coming from the plant?

23. What is the source of said emissions?

24. State whether or not the source is in excess of the allowable limits provided in Rule 105.2 of the State Air Control Board Regulations. How much?

25. Describe your training and experience with respect to conducting opacity tests?

26. How accurate must you be to qualify to make visual opacity readings?

27. Describe fully how you made the opacity reading? Where were you located with respect to the stack that was read?

28. State whether or not the source was in excess of the allowable opacity limit provided in Rule 103 of the State Air Control Board Regulations?

PART B - QUESTIONS ASKED IN CROSS-EXAMINATION OF THE FIELD ENFORCEMENT OFFICER BY THE DEFENSE COUNSEL

The following questions were part of the cross-examination of the investigator by the defense counsel. They are based on those actually asked in the case this exercise is taken from, and therfore they are phrased in the same probing style a good defense attorney would use. You, as a field enforcement officer, should be able to answer them in a calm and direct way. Remember that the opposing counsel can ask an adverse witness (in this case, the investigator) leading questions.

1. When you are conducting a suspended particulate matter test, is it possible to get an amount sufficient to constitute a violation in just a few minutes?

2. Even though the test might still be run for several hours?

3. It appears from your report that you set up and started the downwind sampler a full 20 minutes before the upwind sampler. Is that correct?

4. Did you and your partner leave the downwind sampler while you started the upwind?

5. (If they did:) You left it unguarded? Unprotected?

6. Isn't it possible that someone could have come by when you were setting up the upwind and dumped dirt or some other substance in the sampler?

7. Can you state, of your own personal knowledge, that it wasn't tampered with during that time?

8. You stated that the purpose of the upwind is to measure the suspended particulate matter level upwind of the plant so that you can determine the amount leaving the plant premises which the plant is responsible for. Is that correct?

9. Isn't it possible that during this twenty minutes you could have collected a high amount of suspended particulate matter from

upwind of the plant in the downwind sampler thereby showing a violation, without the upwind sampler showing it?

10. You can't always see suspended particulate matter, can you? It's possible, isn't it?

11. You can't then state of your own personal knowledge that it didn't happen, can you?

12. Now, the downwind sampler was next to the road on the shoulder, right?

13. The road has gravel shoulders, doesn't it?

14. Anytime a car or truck passed, it would stir up the dust and whip it around?

15. It could get in the sampler, couldn't it? A road is a windy place usually anyway, isn't it?

16. The dust could get in the machine and affect the sample, couldn't it?

17. It appears from your map or drawing that the two samplers were not placed due upwind and downwind in relation to the plant. Is that correct?

18. Why not?

19. Can you see the downwind site from the upwind site or vice-versa?

20. How would you know they were due upwind or downwind in relation to the plant? Don't you bother to use a compass to line them up correctly?

21. The wind was variable and shifting directions, wasn't it?

22. Everytime you had a shift in wind to out of the southeast it could also bring a high level of particulate matter from some other source into the downwind sampler, couldn't it? without the upwind sampler ever detecting it, isn't that correct?

23. At any rate, if the wind shifted from out of the southwest to the southeast, the upwind sample couldn't accurately show what amount was actually upwind of the plant?

24. In fact, the downwind wouldn't even show what was coming off the plant, would it? It could be picking up some other source? a higher level source?

25. Where did you set the generator that runs the sampler? Could exhaust from the generator have been caught in the downwind sampler?

26. Was the generator calibrated? If it wasn't functioning properly, couldn't it mess up the sample?

27. Where did you put the sample paper in the machine? Where did you take it out of the machine?

28. Do you smoke? Were you smoking when you were handling the sample paper?

29. Do you ever sue farmers for violating Regulation 105.2?

30. Wouldn't a farmer, when he is plowing or cultivating his field, be in violation of Regulation 105.2?

31. There is no provision in the regulations exempting him, is there? Or do you know the regulations that well?

32. Why don't you sue farmers and put them out of business? Why don't you require them to install pollution abatement equipment on their tractors?

33. Couldn't suspended particulate matter from a farmer's plow do just as much harm as any suspended particulate matter from Columbia Smelting Co.?

34. Isn't Columbia Smelting just as important to the economy and security of this country as the farmer?

35. Can you say of your own personal knowledge that this suspended particulate sample is accurate?

36. Who arrived at the 100 ug/m^3 as the maximum allowable suspended particulate matter level? How?

37. Has anyone in your agency done any independent study as to health effects, or did you just borrow the standard from someone else?

38. Have you, yourself ever done any in-depth research as to health effects?

39. You can't state of your own personal knowledge whether or not the regulation is reasonably related to health, can you?

40. You can't state whether or not the regulation is reasonable, can you?

41. Who thought up the 30% figure for opacity?

42. Has anyone done any research or study as to the health effects of 30% opacity?

43. Did your agency just borrow that figure from another state or from EPA?

44. Did someone just think it up?

45. If it is based upon aesthetics, isn't that very subjective?

46. "Grayish white" smoke looks like clouds, doesn't it? Is there anything unaesthetic about clouds?

47. In fact bright red or yellow smoke might be aesthetically pleasing, couldn't it? Like a sunset?

48. Was this smoke impairing the visibility of motorists on the road?

49. Was this smoke impairing visibility anwhere in the community?

50. In making the opacity readings, where were you reading the plume in relation to the stack?

51. It doesn't say in Rule 103 where you read the plume, does it? It is vague, isn't it?

52. Shouldn't you read the plume at the property line of the plant? After all, that's the closest place it could bother anyone, isn't it?

53. Can you really read the percent opacity by just looking at it? Accurately? Wouldn't the color of the smoke affect your estimate?

54. Bright red smoke wouldn't distract you? The shade and color don't make any difference?

55. You don't think a bias or prejudice against the company you were testing might unconsciously affect your reading?

56. At any rate, the accuracy of the reading is based entirely on the credibility of the investigator, isn't that correct? You would just have to take his word that the company was in violation, right?

57. Have you had any arguments or disputes with the plant manager?

58. What were you using as a background, the sky?

59. You stated in your report that this was a cloudy day?

60. Wouldn't grayish white smoke blend in with a cloudy background?

61. What does your training manual say about reading white smoke against a cloudy background?

62. A cloudy background could give you a much higher reading - even 100%, couldn't it?

63. Isn't it possible that a cloud could have gotten in the way while you were concentrating on the plume, and you just didn't see it?

64. After all you were looking into the sun, weren't you?

65. It appears, based on your map, that you would be northeast of the plant looking southeast in making your readings, isn't that correct?

66. In relation to the map at about 2:00 P.M., wouldn't the sun be in the southwest? So you would have to have been looking into or in the direction of the sun, correct?

67. What does your training manual say about taking readings with respect to the sun? Why?

68. Based on the wind direction shown on the map, you were not at a right angle with the plume when you made your readings, correct?

69. What does the manual say about where you should be in relation to which way the plume is drifting? Why?

70. In fact, the plume was coming toward you, wasn't it? You were looking into the plume?

71. Did you take any other readings within sixty minutes of this reading? (If he did not:) Then you can't say that the plant was in excess of the limit during sixty consecutive minutes of your first reading, can you?

72. Can you say, of your own personal knowledge, that the visible emissions did not occur "during the cleaning of a firebox or the building of a new fire, sootblowing, equipment changes, ash removal and rapping of precipitators"?

73. Doesn't Rule 103.1 permit emissions in excess of the limits for a period of five minutes in any sixty consecutive minutes, or six hours in any ten day period during the cleaning of a firebox or the building of a new fire, sootblowing, equipment changes, ash removal and rapping of precipitators?

LESSON 13

ANSWER KEY

ODOROUS GASEOUS EMISSIONS COMPLAINT HANDLING

Q. Assuming that Harry neither did nor saw anything more than that stated in the case history, prepare a critique of his investigative technique. Indicate all errors and deficiencies in his technique.

CRITIQUE OF THE INVESTIGATION

As stated earlier, the field enforcement officer had little, if any, practical experience in the investigation of air pollution complaints. One of his principal mistakes was his assumption that, because he could not detect any malodors, a problem did not exist. The following procedures would have been good technique:

1. Harry should have noted the direction from the complainant's home to the plant, any significant topographical features (or lack of them), and the prevailing wind direction.

2. The inspector failed to ask Mrs. Rust to characterize the odor and to indicate when it was most prevalent. He also neglected to ask whether or not she had noticed the wind direction during the episode and failed to record the names and addresses of the other complainants indicated by Mrs. Rust. Several of these people should have been contacted and questioned concerning the characteristics and prevalence of the odor episodes and the wind direction during the episodes.

3. Upon arrival at the plant, Harry should have attempted to get downwind of the plant to determine whether or not there was an odor emanating from the plant's operations.

4. He properly identified himself and was correct in accepting an interview with the plant engineer when the plant manager was not available.

5. The interview with the plant engineer was carried out poorly. It should have been specifically directed toward obtaining information about the process operations as they affected the air pollution potential: the operating and maintenance procedures, the operation of the air pollution control equipment, and the review of records related to the preceding. Some specific items which should have been obtained are:

   a. Types and quantities of paints used, including types and percentages of solvents used in the paints.

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b. Oven temperatures.

c. Temperatures and volumes of the various effluent streams.

d. Operation and maintenance schedules, including times of day when paint baking occurs and any unusual operating conditions such as formulations that require higher baking temperatures or contain unusually high percentages of solvents or particularly odorous solvents.

e. Control system data including information on temperatures of inlet and outlet gases, volumetric throughput, and catalyst maintenance schedules.

6. During the interview, the plant's operating permit should have been reviewed and inquiries made to determine that the plant's equipment and operation was actually the same as that covered in the permit.

7. After the interview, the plant inspection should have been utilized to verify wherever possible the information given in the interview. The inspection should have covered the following:

a. Inspection of the specific equipment used for each phase of the production operation.

b. Inspection hooding, ducts, fans, drive belts, temperature recorders, and general level of maintenance.

c. Inspection of air pollution control equipment. Review of any charts, recordings or maintenance schedules utilized in conjunction with the control equipment.

d. An attempt should have been made to get onto the roof in the vicinity of the stacks to ascertain whether any odor could be detected in the exhaust gases.

8. After the plant inspection, Harry should have made a greater effort to determine if the metal-plating plant mentioned by Mr. Erb could actually have been the malodor source. Merely driving by the plant is hardly a proper investigative technique.. An investigation similar to that done at the Alcoat Company should have been performed at the metal-coating company.

9. Prior to completing his report and recommendations, Harry should have discussed the case with a more experienced investigator. It is likely that the shortcomings of his investigation would have been pointed out to him and a proper investigation rescheduled.

Assuming that the investigation indicated that the Alcoat Company was indeed the source of the odors, explain how you would go about establishing a bona fide air pollution case. Remember that there are no specific odor control regulations and that the burden of proof in establishing air pollution as defined in the agency's ordinance rests with the agency. An odor problem of this type is effectively a public nuisance and the manner of establishing the existence of the problem would be similar to that used to establish the existence of a public nuisance.

COLLECTING DATA FOR ESTABLISHING THE CASE

Once Harry's superiors had determined that the complaints were increasing rapidly in number and that they were coming from various locations throughout Orangeland, they immediately consulted with him and advised him of the procedures to be followed:

1. Obtain a complete description of the area surrounding the Alcoat plant including the plant location, the location of the residents, distances and direction from plant to complainants, significant topographical features, and location and nature of any other sources in the immediate area which could be causing a problem.

2. Contact all of the complainants and determine, if possible, the character of the malodors: when they are most prevalent, their duration and wind direction at time of occurrence, and any other pertinent data.

3. Request the citizens' assistance by establishing a citizens' odor panel. (Five or six of the residents are to be asked to keep a log of malodor episodes and record, to the best of their ability, the character of the odor, the strength of the odor, the times of occurrence (noting the duration), and the wind direction during the episode.)

4. Revisit the Orangeland area as frequently as possible until the existence of the malodors is conclusively established. Determine whether the odors could be related to the Alcoat plant by backtracking them when they are detected in Orangeland.

5. Revisit the Alcoat plant for the purpose of conducting a proper inspection and request the plant to routinely submit operating schedules to the agency.

6. Obtain wind speed and direction data from a nearby airport weather station.

7. Ask the agency technical staff to review the plant data to evaluate the odor potential of the various solvents used by the Alcoat Company, and request the engineering staff to investigate and evaluate the performance of the catalytic combustion units utilized by the company.

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ANALYSIS OF DATA AND ESTABLISHMENT OF CASE

As during the initial investigation, at the follow-up investigations Alcoat repeatedly claimed that it had no odorous emission problems and that it was conforming to all applicable air pollution control regulations. They again implied that if there was a problem in the area it was caused either by some other company or by malfunctioning of local sewage disposal systems.

In rebuttal to the company's position, the agency determined that:

1. The Alcoat Company is located less than one-half mile due west of Orangeland. Any winds blowing from the northwest through the southwest quadrant would blow across the plant and impinge upon some area of Orangeland. Meteorological data accumulated over the past three years indicates that during sixty-one (61) percent of the time, the wind blows towards the development from the northwest through the southwest quadrant. There are no significant topographical features that interfere with this wind flow.

2. All complainants were contacted. They characterized the odor as a solvent-type odor or as an eye and nose irritant. One complainant characterized the odor as that of rotten cabbage. It was subsequently determined that this individual's neighbor had a seeping septic tank system which was causing a localized odor problem.

   In all, thirty families were contacted. Twenty-five of the families indicated that the solvent odors were severe enough to require corrective action. Fifteen of the complainants indicated that they would be willing to testify in court.

3. Eight of the complainants were selected to monitor and log odor episodes in their area. These logs indicated that the odors are characteristic of solvent odors, are very strong when detected, and are usually present when the wind is blowing from the Alcoat plant toward their homes. The location of the metal-plating plant is such that it would not have been the source of the odors during the monitored episodes.

4. Harry and another inspector were assigned to visit the Orangeland area at random times. Over a period of two weeks during which time they conducted seventeen investigations, they confirmed the existence of solvent odors and other irritation gases in the Orangeland area twelve times. In nine out of the twelve verified episodes, the inspectors were able to report that the odors became stronger as they approached the Alcoat plant and that they were not present upwind of the plant. The dates and times of the observations were carefully recorded.

5. A more thorough investigation was conducted at the Alcoat plant. It was determined that the plant operates twenty-four hours a day and consumes approximately one-hundred gallons of paint per hour per production line. The paint composition normally is about 40% solvents (by volume). These solvents include, but are not limited to, amyl alcohol, methyl alcohol, methyl ethyl ketone, xylol and naptha. Phenolic resins are widely used in the paint formulations. The ovens operate at approximately 450°F and the volume of effluent is approximately 10,000 scfm per oven.

A trained observer, who visited the plant site, indicated that the odors present were characteristic of solvent odors and partially oxidized and polymerized organic solvents and resins. A review of the catalytic combustion units showed that there was little, if any, temperature differential across the catalyst. Residual odors were noted near the exhaust of the quenching operation.

6. A literature search on the solvents used revealed that the presence of methyl alcohol, amyl alcohol and methyl ethyl ketone in the air may cause irritation of the membranes of the eye and respiratory organs. The phenolic resins are normally stable at temperatures below 400°F. When heated above 400°F in compounds, the resins will release formaldehyde.

DISPOSITION OF CASE

Upon completion of the investigation, Alcoat was advised of the agency's findings and ordered to take corrective action. The company appealed the order and the case was heard before a hearing examiner. After listening to the testimony of ten complainants, and after hearing the comprehensive case that the agency had prepared (based on the previous information), the hearing examiner found for the agency. In his adjudication, he ordered the company to comply with the agency's directive.

The company claimed that they were not causing air pollution: that there were other sources of odor in the area, and that, in any event the ordinance was unconstitutional as it failed to set forth adequate standards for the determination of the existence of air pollution. In addition, they felt that the definition of air pollution was vague and uncertain and not susceptible to acceptable standards of proof. They were not satisfied with the hearing examiner's adjudication and appealed to the county court.

The county court carefully reviewed the record of the case and the testimony presented before the hearing examiner. The court found that "There is no doubt that the evidence confirming the existence of an air pollution problem is substantial. The testimony amply supports the hearing examiner's findings." As a result of its determinations, the court dismissed the appeal and ordered that the adjudication of the hearing examiner be sustained.

The agency won this odor case primarily by producing a preponderant weight of evidence to verify the existence of an air pollution problem. Its careful and thorough investigation was the keystone upon which the entire case was based. Since most odor problems are very subjective in nature, it is important that the investigator accumulate a preponderence of evidence to tip the scales in his direction. It is equally important thet the receptors or the complainants be willing to support the agency's efforts and that they be used to the best advantage.